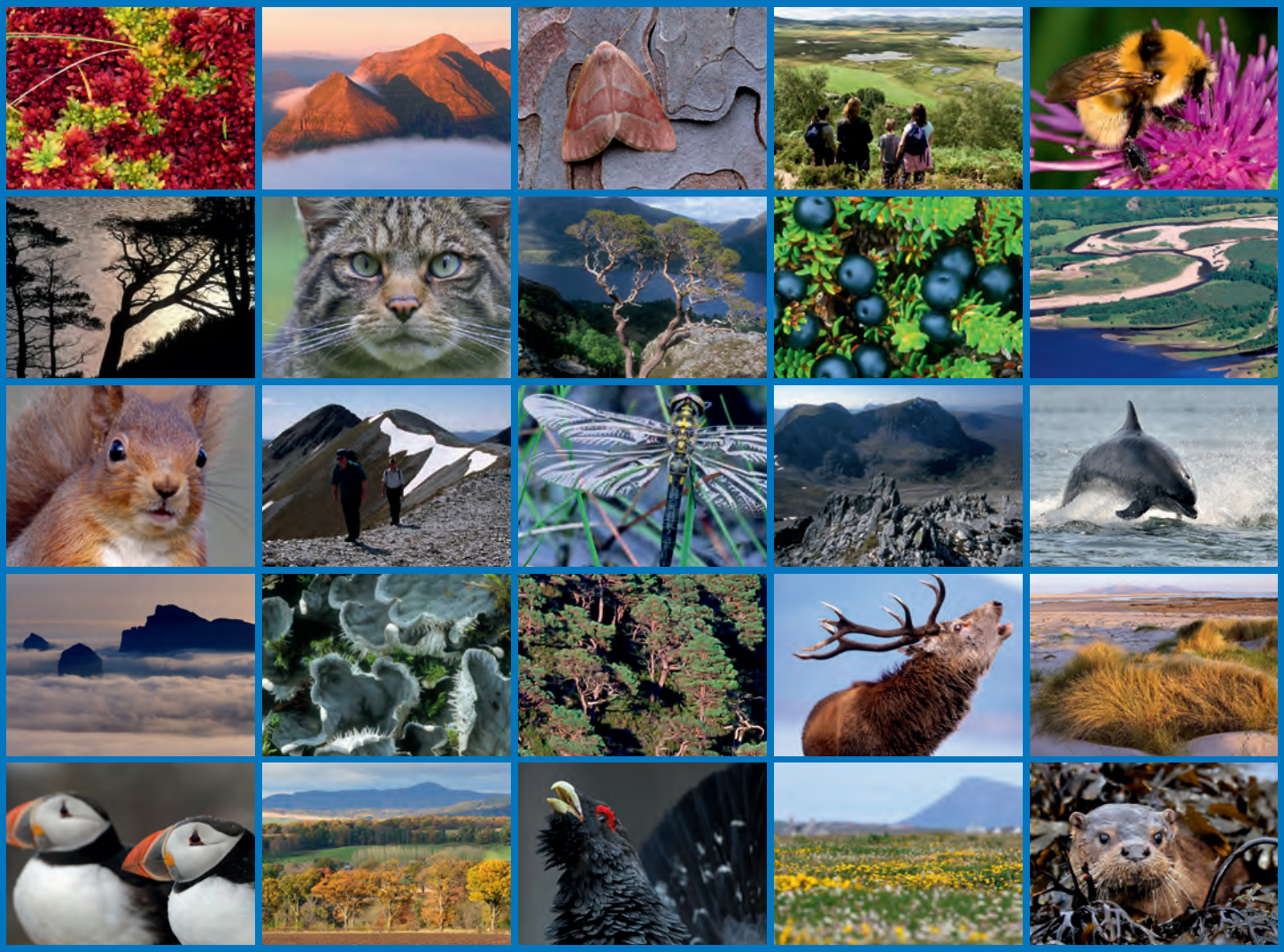
Scottish Natural Heritage
Commissioned Report No. 619

Lamlash Bay, Arran, 2010 survey report



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COMMISSIONED REPORT

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Lamlash Bay, Arran, 2010 survey report

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COMMISSIONED REPORT

Summary

Lamlash Bay, Arran, 2010 survey report

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Keywords

Lamlash bay; Arran; No Take Zone; baseline survey; biotope mapping.

Background

Following proposals made by the Community of Arran Seabed Trust (COAST), a no-take zone (NTZ) of 268 ha was established in the northern part of Lamlash Bay in 2008 under the Inshore Fishing (Scotland) Act 1984. During 2008 and 2009 survey work mapped the seabed habitats of Lamlash Bay and surrounding waters. The aim of the study described in this report was to refine the biotope mapping within and immediately adjacent to the NTZ and to conduct a baseline survey. The baseline survey focuses on benthic habitats and sessile and low mobility species although highly mobile species (e.g. fish species) were also noted. A combination of methods, including remote video, remote stills, grab sampling and diving, were employed to collect these baseline data.

Main findings

- Ten biotopes were mapped, either as discrete biotopes or biotope complexes.
- There was no significant difference between the main infaunal biotope/biotope complexes inside and outside the NTZ in 2010.
- Epifauna and substrata at selected sites nearby but outside the NTZ (sites S1 and S3) were in a condition consistent with the likely impacts of mobile fishing gear.
- Extensive areas of maerl gravel were found in the shallow, northern part of the bay; little live maerl was found in the maerl gravel beds.

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1. INTRODUCTION

Lamlash Bay lies on the east coast of the island of Arran, in the Firth of Clyde, south-west Scotland. It is a shallow, relatively sheltered bay, protected to the west and north by Arran and to the east by Holy Island which forms a natural barrier across much of the mouth of the bay. There are two channels into the bay, either side of Holy Island; the main one to the north-east and a narrower one to the south-east. The shores of the bay are gently shelving, with predominantly sand and pebble beaches. The village of Lamlash (population 1,100 in 2004) lies along the edge of the central part of the bay.

Following proposals made by the Community of Arran Seabed Trust (COAST), a no-take zone (NTZ) of 268 ha was established in the northern part of Lamlash Bay in 2008 under the Inshore Fishing (Scotland) Act 1984 (Figure 1). This is bounded to the north by the bay shoreline and to the south by the shores of Holy Island; the eastern boundary lies along lines drawn between Clachlands Point and Hamilton Rock (NE) and the north-east coast of Holy Island. The western boundary lies along a line drawn between Mount Pleasant Farm (NW) and White Point, Holy Island (SW).

During 2008 and 2009 survey work was conducted for broadscale mapping of the seabed habitats of Lamlash Bay and surrounding waters (Figure 2), using sidescan sonar to map seabed features with drop-down photo/video analysis and some grab sampling (particle-size and infaunal analysis) for biotope classification and ground-truthing purposes (Axelsson *et al.*, 2010).

The aim of the study described in this report was to refine the biotope mapping within and immediately adjacent to the NTZ and to conduct a baseline survey. The baseline survey focuses on benthic habitats and sessile and low mobility species, although highly mobile species (e.g. fish species) were also noted.

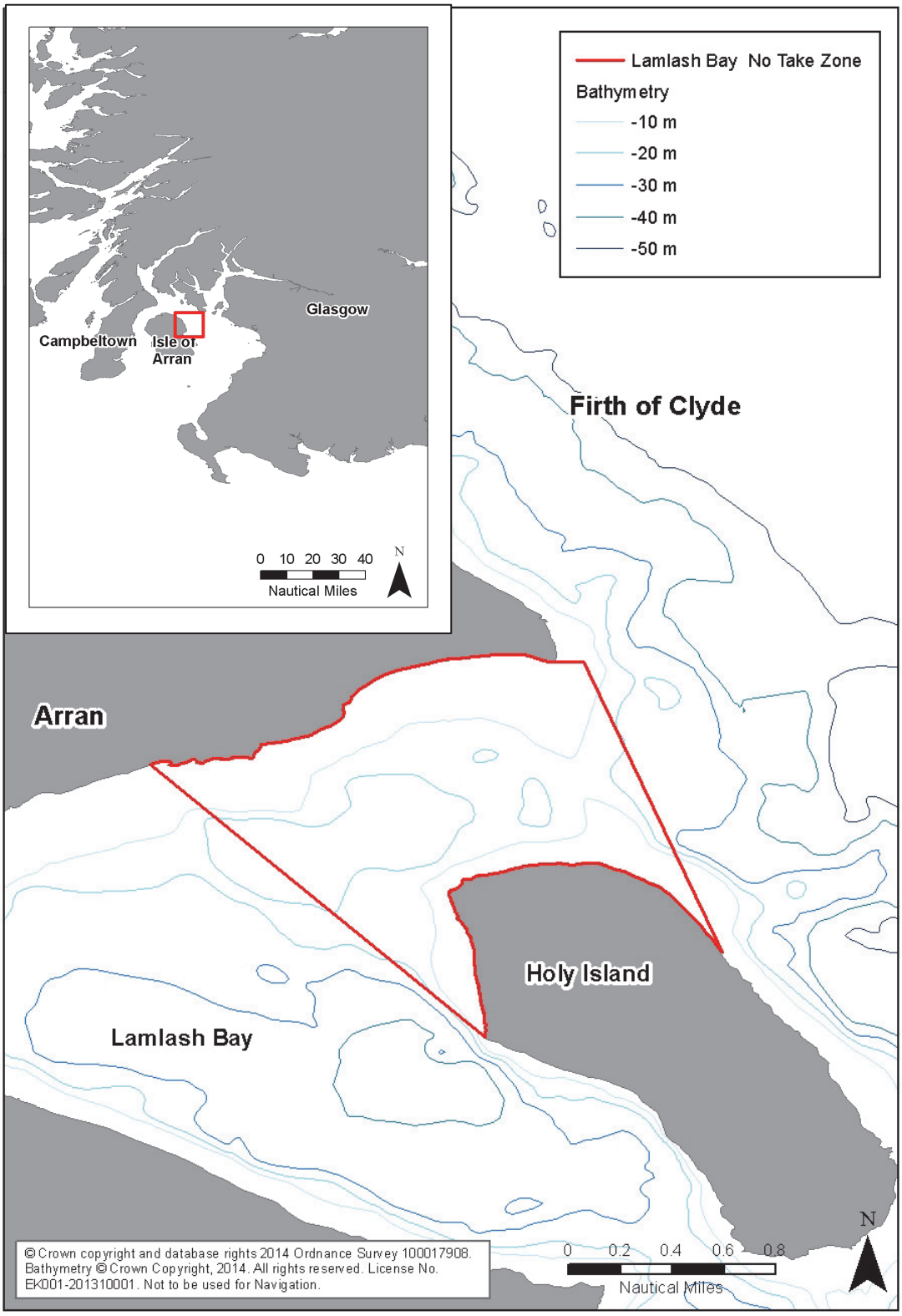

Figure 1. Lamlash Bay No-Take Zone.

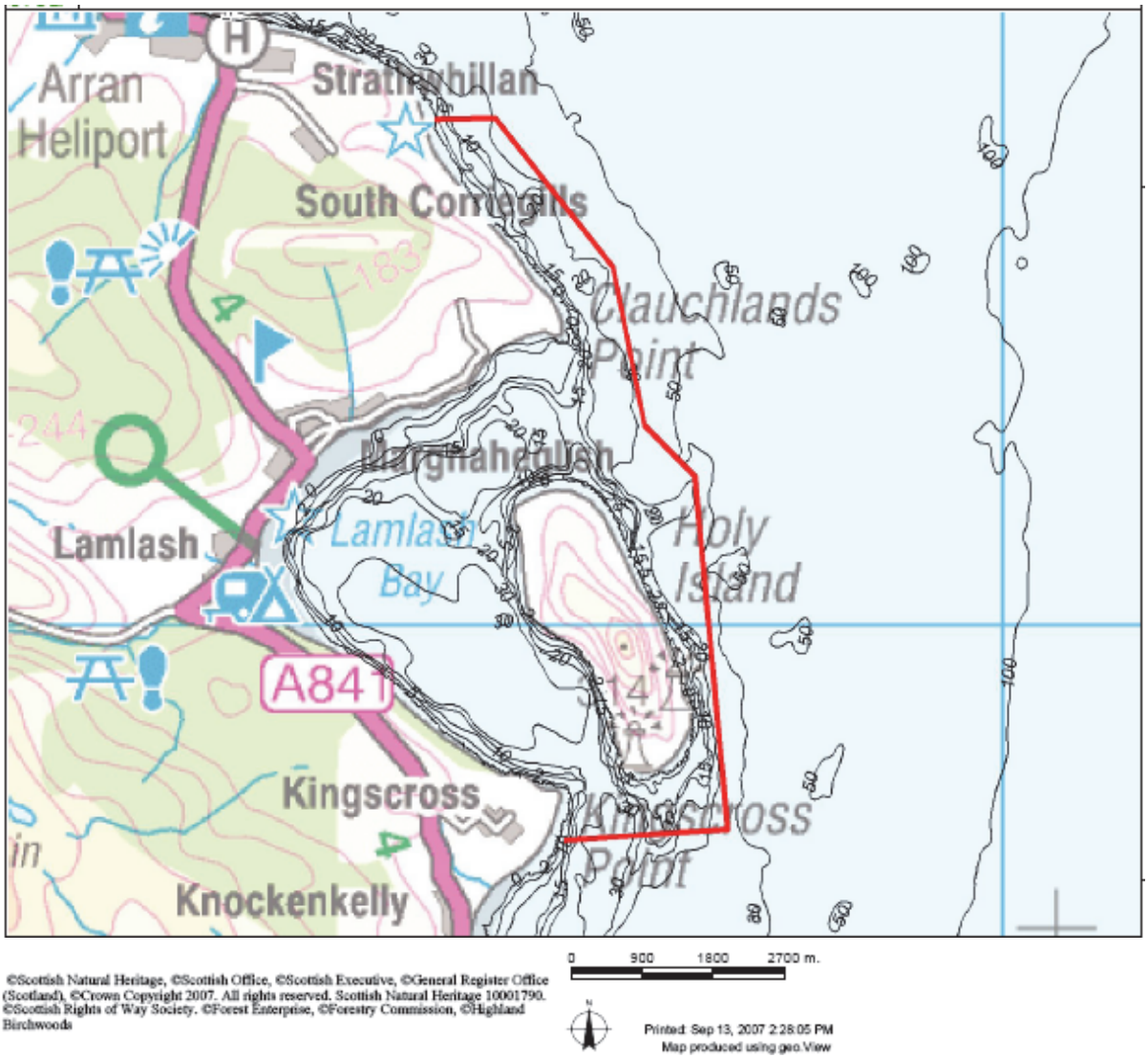

Figure 2. Lamlash Bay and adjacent water; the outer boundaries of the 2008-09 mapping survey are shown in red. The NTZ is within the bay itself (Figure 1), from Axelsson et al., 2009.

2. METHODS

The baseline survey was conducted between the 21st August and the 4th September 2010. All survey work was conducted from Marine Bio-images' road-trailable vessel *Freyja*, a 5.4m Avon rigid hulled inflatable. The vessel was launched and recovered from the slipway by Lamlash pier at the start and end of every day. Survey stations were identified to refine the biotope maps produced in the earlier survey (Axelsson *et al.*, 2010). In particular, the *Phymatolithon calcareum* maerl bed biotope (**SS.SMp.Mrl.Pcal**) provisionally mapped was expected to be the highest priority and so identifying the boundaries of the bed was prioritised. As a deeper draft vessel was used for mapping during the earlier survey it was also necessary to complete the mapping exercise in the shallow areas that had not been covered. Once this mapping was achieved 12 dive stations and 12 grab stations were identified, plus 20 stations for towed video and stills. The locations of these were evenly split between inside and outside the NTZ to provide comparative data.

2.1 Biotope mapping using drop-video and grabbing

Predictive biotope mapping was conducted using a combination of remote video and grab sampling. The earlier maps produced by Seastar (Axelsson *et al.*, 2010) were used as a starting point but were not incorporated in to the final map due to differences in methodology. The key purpose of this was to better define the maerl biotope **SS.SMp.Mrl.Pcal** (*Phymatolithon calcareum* maerl beds in infralittoral clean gravel or coarse sand), which was considered the priority habitat. Areas identified as **SS.SMp.Mrl.Pcal** had been mapped within and to the north of the NTZ, but the 2008-09 broadscale mapping surveys did not cover some shallow areas due to the vessel draught restrictions. As maerl can flourish in shallow areas where light levels are higher it was possible the bed extended considerably into this previously unsurveyed area. A hand deployed drop-video system and hand deployed Van Veen grab (0.025 m^2 surface area) were used to provide rapid coverage. Working from a small RIB allowed the system to be deployed in less than 2 m water depth.

A Sony DCR-PC110E DV camera recorder, within a Gates housing with super-wide dome port, linked by umbilical to an LCD surface monitor, was used for viewing video images. This was deployed by hand in a lightweight frame (Figure 3). The video was allowed to drift across the sea bed for a few minutes, approximately 20 cm off the bottom although this varied depending on sea conditions. The live picture was viewed on a surface monitor by one surveyor who gave a commentary describing the sea bed and species observed. This was transcribed in to a field notepad by a second surveyor. For the purpose of biotope mapping, when taken, grab sample contents were subject to rapid assessment only.

Data were plotted each evening to produce working maps of the seabed habitats. The location of these video and grab mapping locations is shown in Figure 4.

2.2 Dive survey

Once the mapping exercise was completed the data generated were used to help select suitable locations for dive stations. Twelve dive stations were selected; six within the NTZ and six outside but in similar depths and on similar habitat. Although site selection was to some degree random parameters such as depth and the distribution of target substrate types, representativeness of surrounding area and good spatial distribution across the target substrates were also key considerations. The diving focused on the shallower parts of the bay, thus giving maximum return in terms of the amount of time that could be spent underwater and so the amount of data collected. All dives were conducted between 5-14 m sea level (2-12 m chart datum). The locations of all dives are shown in Figure 5 and are given in Appendix 1, Table A1.1.

Each dive station was located using GPS. A shot line marked with a surface buoy was then deployed to ensure the divers descended on the exact location.

A four person dive team was used for this operation; operating as two dive pairs. Whilst one pair dived the other worked as supervisor and boat handler. Once on the sea bed the divers reeled out a 12 m long tape, marking a survey transect on the sea bed. Ten metres of this transect was then filmed down one side (right-hand side, travelling away the base of the shot line), the transect starting 2 m out from the base of the shot line. Once this was completed the diver then surveyed along the length of the transect line, recording habitat type and conspicuous species (using the MNCR SACFOR semi-abundance scale). The distant end of the transect was then picked up and the transect line rotated anti-clockwise 6-7 m, then re-deployed and the video and visual survey repeated. Once complete the transect line was lifted and moved as before and a third transect surveyed. Starting 2 m out from the base of the shot line ensured the same area close to the shot was not resurveyed. The second diver dropped a 0.5 x 0.5m quadrat from about 1.5 m above the sea bed, ensuring it landed at a random location but within 6 m of the transect line. The quadrat was then photographed from approximately 60-80 cm above the sea bed, using a housed DSLR camera fitted with a wide-angle lens and twin strobes. This process was repeated, the quadrat being picked up and dropped again, until eight quadrats had been photographed. This was conducted within a radius of 6 m from the shot line. Quadrats marked along all sides at 10 cm intervals were used to aid subsequent counts and estimates of percentage cover. Where possible all identification was done *in situ*. Small plastic bags were used to collect any specimens where *in situ* identification was uncertain. These were examined (under low power or compound microscope if necessary) with reference to standard text, and by other team members, in the evening. All identification was standardised using the World Register of Marine Species (Worms) nomenclature (Appeltans *et al*., 2011).

Once both above tasks were completed all equipment was collected at the base of the shot line and a single core collected. A plastic tubing core (10.3 cm internal diameter, 25 cm long) was used. This was pressed 15 cm in to the sediment before being dug out by hand, or trowel if very compacted), bungs fitted and placed in a net bag. Due to the shell and gravel content of the sediment at many sites a lump hammer was generally required to push the core in 15 cm.

2.3 Grab sampling survey

Grab sampling stations were located in the deeper areas of the bay where dive time would be limited and so diving was less cost-effective (Figure 6). Grab stations were selected to produce representative samples of the deeper and sedimentary habitats within and adjacent to the NTZ with previous mapping work also considered (Axelsson *et al*., 2009). The depth range was 17-30 m. As these areas were primarily softer, muddier habitats grab sampling was an appropriate method here. A hand deployed Van Veen grab (0.025 m^2 surface area) was used to collect samples.

Figure 3. Combined drop down video and stills system being deployed.

One infaunal sample was collected at all 12 grab sampling stations (Figure 6); locations are given in Appendix 1, Table A1.2. Samples were placed into labelled buckets on board the survey boat, then sieved at the shoreline when the boat returned to the slipway at the end of each day. Samples were sieved through a 0.5 mm mesh and material retained on the mesh was transferred to labelled, lidded buckets. Buffered formalin was added to prevent dissolution of shells. Samples were subsequently transported to the Aquatonics Ltd laboratory at the end of fieldwork for infaunal analysis. At six of the stations (stations 2, 4, 6, 8, 10 and 12) a second grab sample was collected for particle size analysis (PSA) and organic carbon content. These samples were stored in labelled plastic bags and frozen at the end of the day. At the end of fieldwork these samples were transferred to the laboratory of Dr. Rob Nunny (Ambios Environmental) for PSA and organic carbon analysis.

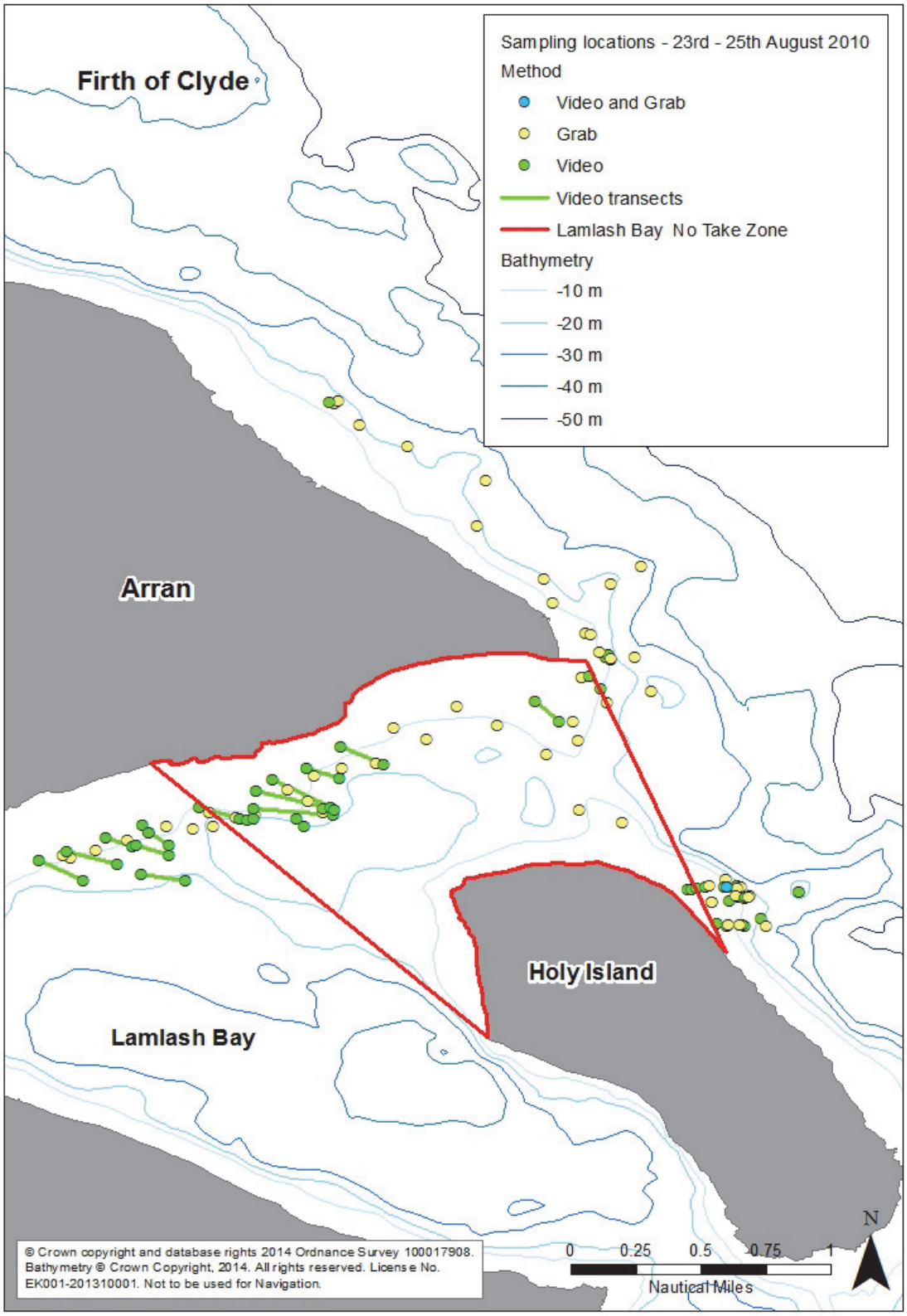

Figure 4. Drop-video and grabbing locations (see section 2.1).

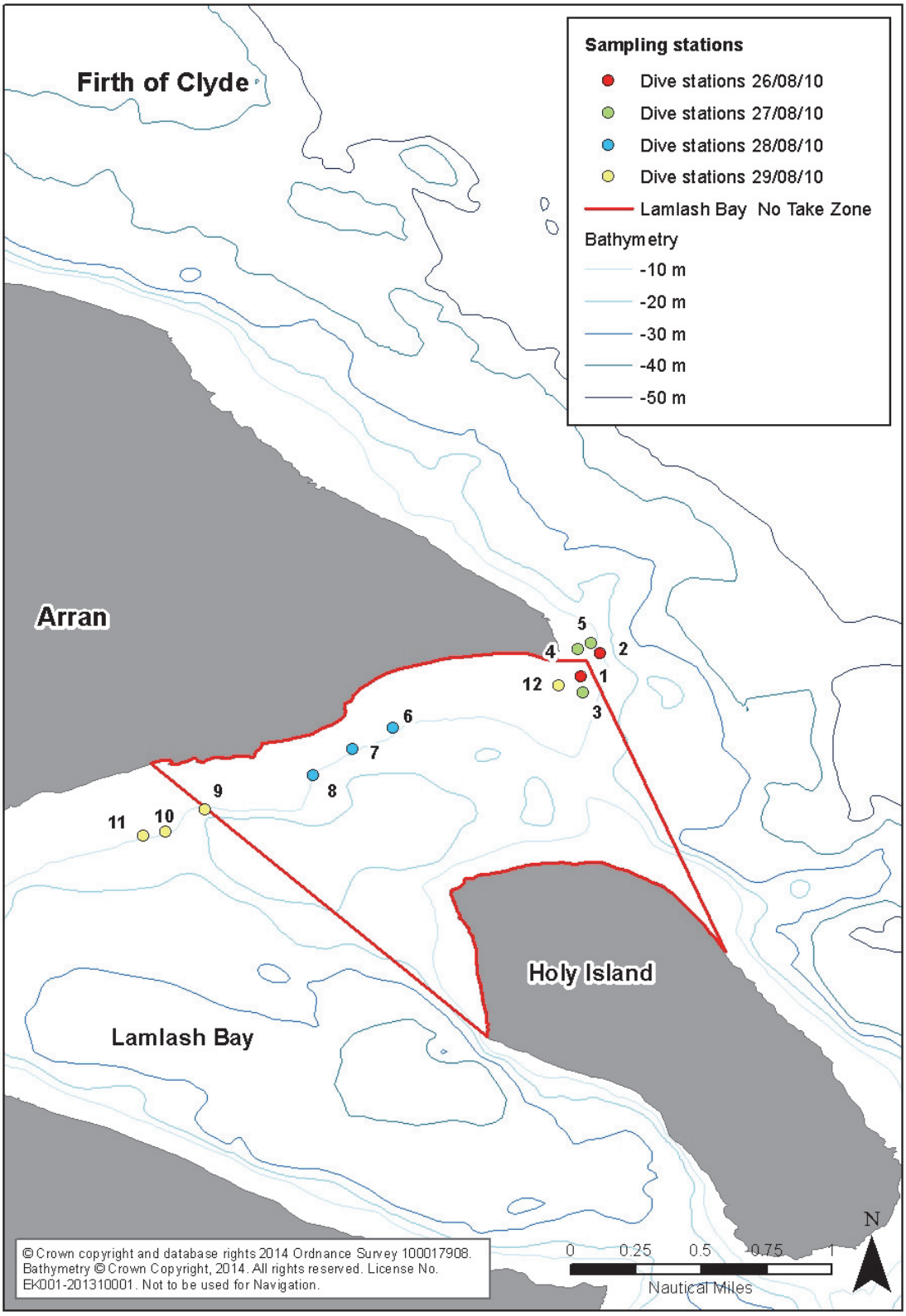

Figure 5. Dive survey stations (see section 2.2).

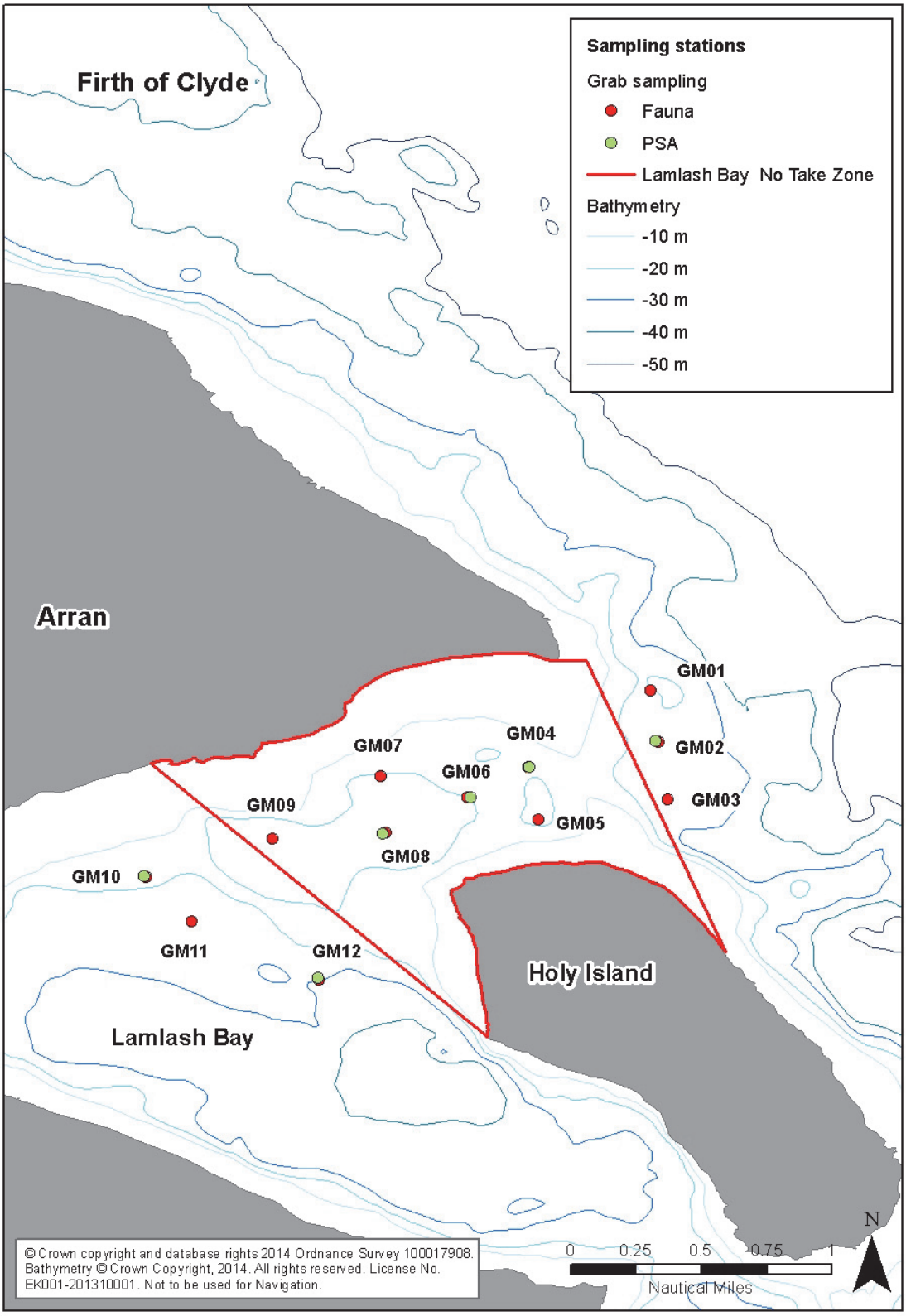

Figure 6. Grab sampling stations (see section 2.3).

2.4 Towed video and stills survey

To describe the habitat surface features and epifauna in the deeper, central part of the NTZ and adjacent areas a series of short tows, combining video and still images, were conducted. A 10 megapixel digital stills camera was mounted parallel to the video camera on the drop-video system (Figure 3). The camera system was allowed to drift slowly across the sea bed for approximately 3 minutes. Stills were taken every 10 seconds; this allowed between 20 and 25 stills to be taken on most transects, varying slightly with conditions. A total of 20 transects were completed (identified as TR12-TR31). The location of these can be seen in Figure 7. Positions for all tows are given in Appendix 3, Table A3.2. Video images were captured on miniDV tape; stills were captured as high resolution JPEGs on SD memory card, then downloaded on to a laptop hard drive each evening.

Video was viewed on a surface monitor during each tow. General habitat description and conspicuous species notes were made. A visual check was also made that the stills camera strobes were firing. All video footage was subsequently viewed on a 17 inch computer monitor. Each tow was inspected with more detailed notes made whilst viewing, supplementing the earlier field notes. All identifiable species were recorded and, where possible, MNCR SACFOR abundances given. All stills from each tow were also viewed on a large monitor, habitat descriptions compared with those derived from video footage and notes amended if necessary. Similarly, stills images were inspected and all identifiable species noted. Numbers of individuals noted within all stills from a given tow were used to derive MNCR SACFOR abundances. These values were compared with abundances derived from video analysis and any adjustments considered necessary were made, with judgements being made as to which method provided the better data for a given species. Species and their abundances are given in Appendix 3, Table A3.1.

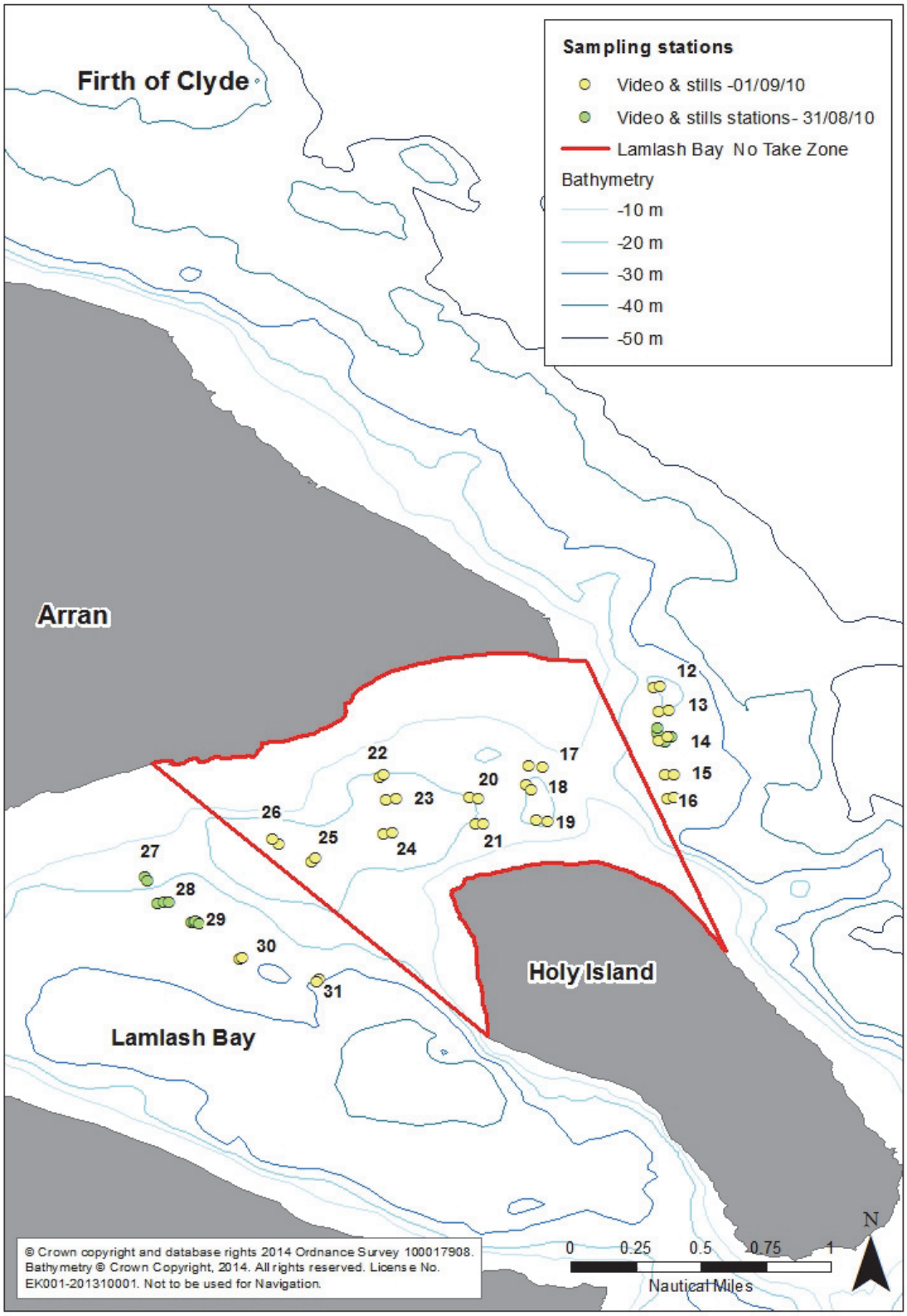

Figure 7. Combined towed video and stills transect locations (see section 2.4).

2.5 Infaunal analysis

Once core and grab samples arrived at Aquatonics' laboratory, each sample was washed through a 0.5 mm mesh to remove the formalin. The lighter fraction was transferred to a 0.5 mm sieve by repeated elutriation of the sample. This lighter fraction contained most of the taxa present in the sample. The dense fraction was in some cases sieved through a nest of sieves (4 mm, 2 mm, 1 mm and 0.5 mm) to aid sample sorting and removal of specimens. Most specimens were identified by Dr Phil Smith of Aquatonics Ltd. Difficult specimens (e.g. many syllid and maldanid polychaetes) were sent to Dr Peter Garwood (Identichaet) for confirmation or identification. As part of the QA process Dr Garwood also selected taxa from our list for checking. The QA process showed that there was some difficulty in distinguishing between the spionid polychaetes *Prionospio fallax* and *Minuspio cirrifera*. Consequently the results for these two species have been combined. The external QA also showed that some of the *Nucula nucleus* reported may include some *Nucula nitidosa* and *Nuculoma tenuis*.

The sample sorting took significantly longer than expected, in most cases a full day was required to sort a sample. Identification of specimens from a sample took 2-4 days, with most samples taking approximately 3 days. The long time required was due to large quantities of coarse material in most samples to examine (all except the 4 mm fraction was sorted under a binocular microscope) and the large number of taxa and specimens present.

2.6 Particle size analysis and organic carbon analysis

2.6.1 Particle size analysis

Sediments were stored frozen after receipt at the laboratory until analysed. Sediment samples were 0.5 to 1 kg in weight and contained a significant gravel content (30-60%). No bulk sub-sampling procedure was deemed necessary due to sample size. On defrosting, all samples were inspected to see if they needed wet sieving (i.e. contained more than about 5% mud).

Samples assessed for dry sieving only were processed to quantitatively determine the particle size distribution of the sand fraction (0.063 –2 mm) and gravel fraction (>2 mm) using a dry sieving method. A sample of the fine material passing the 63 µm sieve was collected for organic carbon analysis (see section 2.6.2). Those samples assessed for wet sieving were processed, then the sand fraction dry-sieved. Identical subsamples for pipette analysis (particle-size of mud) and organic carbon analysis were retrieved during the wet sieving process. Particle-size statistics were generated using 'Gravistat' software. This methodology is based on British Standard 1377 parts 1 and 2 (British Standards Institute, 1990).

2.6.2 Organic Carbon Analysis

2.6.2.1 Standardisation of ferrous sulphate

Ten millilitres of the normal[1] potassium dichromate solution was run from a burette into a 0.5 litre beaker. Twenty millilitres of concentrated sulphuric acid was then added, swirled and allowed to cool for some minutes. Two-hundred millilitres of distilled water, 10 ml of orthophosporic acid and 2 ml of redox indicator were then added. This was then set to stir on a magnetic stirrer. Ferrous sulphate was then added from a second burette until the colour of the solution changes from blue-green to red. A further 0.5 ml of potassium dichromate was then added, turning the colour back to blue-green. Ferrous sulphate was then added drop by

[1] 'Normal' here refers to a normal (as opposed to a molar) solution. Normality of a solution is defined as the molar concentration (c_i) divided by an equivalence factor (f_{eq}): Normality = c_i / f_{eq}

drop, with the stirrer operating, until the single drop when the colour changed back to red. The total volume of ferrous sulphate used (x) was recorded, to the nearest 0.05 ml.

About 1 g of the oven dried <63 µm sediment was weighed to an accuracy of 4 decimal points, and added to a 0.5 litre beaker. Non-organic carbon (carbonate) was removed using the method of Shaw (1959). Twenty-five ml of sulphurous acid was added to each 25 ml beaker (sufficient for 1 g of carbonate, although checking takes place) and swirled thoroughly and left for 3 hours minimum. The mixture was then placed in an oven at 60^{o}C until dry.

Sample titrations were then prepared. The total volume of potassium dichromate used in the oxidation of the organic matter in the sediment was determined by:

$$10.5\ X\ (1-y/x)\ ml$$

(x = total volume of ferrous sulphate in the standardisation test; y = total volume of ferrous sulphate used)

The correct results are only given if this value lies between 5 and 8 ml.

Analyses were repeated if necessary to give a volume-used value in the correct range (high value: less sediment weighed in; low value: more sediment weighed in).

The results were calibrated against an MESS2 standard of known organic content and the results calibrated accordingly. This methodology is based on British Standard BS 1377 (British Standards Institute, 1990).

2.7 Additional dive sites S1 and S3

Two additional dive locations were dived on completion of the pre-planned dive stations. These were locations proposed by SNH as anecdotal reports and indirect evidence (apparent dredge scars on sidescan sonar) suggested there had been some scallop dredging activity in both vicinities. These dive sites are recorded as S1 (dive 13) and S3 (dive 14). Dive site S1 is located approximately 0.64 km NNW of Clauchlands Point (mid-point approximately 55.555880N 05.080222W, WGS84), in approximately 17-20 m chart datum on a gently sloping mixed sediment plain; Dive S3 is located approximately 0.41 km WSW of Clauchlands Point in approximately 27-28 m chart datum on a level, mixed sediment seabed consisting of stone and shell gravel and sand with occasional boulders. A single dive was conducted at each site, the dive pair swimming in a random direction. General notes on the sediment type and topography and site condition were made, species were recorded using MNCR SACFOR abundance scales. Representative stills photographs were taken at both sites.

3. RESULTS

3.1 Biotope mapping

Biotopes were identified using The Marine Habitat Classification for Britain and Ireland (Connor *et al*., 2004). The results of the biotope mapping exercise can be seen in Figure 8. Ten biotopes were mapped within the study area, sometimes as biotope complexes where they could not be readily separated. These are described in Table 1 below. In addition, the biotope **SS.SMp.KSwSS.LsacR.CbPb** (Red seaweeds and kelps on tide-swept mobile infralittoral cobbles and pebbles) was recorded on dive 12, just off Clauchlands Point, on occasional boulder outcrops; as a spot location it was not appropriate to map.

A bed of dead maerl gravel occurs in the shallow (0-10 m) shelf area around the northern edge of the bay, forming a narrow band. Although only a very small percentage of this maerl was live (always <5% and mostly <1% live) the maerl biotope definition does not differentiate between live and dead maerl (OSPAR Commission, 2010), with much of the importance of the habitat deriving from the physical structure of the habitat and the diversity of species it supports. This biotope supported a sparse covering of foliose red algae, including *Bonnemassonia asparagoides*, *Chondrus crispus*, *Gracilaria* or *Gracialriopsis* sp., *Pterocladia capillacea* and *Polysiphonia elongata*. A dense algal mat (probably seasonal) covered much of the more sheltered parts of this maerl gravel bed. *Cerianthus lloydii* was patchily abundant to superabundant in this habitat. Small gobies (*Pomatoschistus pictus* and *P. minutus*) were also common. As the bay shelves the sea bed changes to mixed sediment, comprising large amounts of empty shells, shell fragments, stones, some dead maerl and sand. The deeper parts of the bay are mostly fine or muddy sand supporting large numbers of *Turritella communis*, *Ophiura albida* and *Amphiura* sp. Other notable epifauna include *Cerianthus lloydii*, *Chaetopterus variopedatus*, pagurid crabs, *Munida rugosa*, *Liocarcinus depurator* and *Ophiura albida*.

Table 1. Biotopes mapped and descriptive notes.

Biotope code	Biotope name	Notes
SS.SMp.KSwSS.LsacGraFS	*Laminaria saccharina*, *Gracilaria gracilis* and brown seaweeds on full salinity infralittoral sediment	Recorded at Dive stations 7 and 9, probably shallower than maerl habitat.
IR.MIR.KR	Kelp and red seaweeds (moderate energy infralittoral rock)	This biotope was mapped along the East coast of Holy Island. Described from only a few video drops so not fully described.
SS.SMp.Mrl.Pcal.R	*Phymatolithon calcareum* maerl beds with red seaweeds in shallow infralittoral clean gravel or coarse sand.	In Lamlash Bay the live maerl component was largely absent (<1% live). The key red algal noted were *Aglaothamnion* ?*byssoides* , *Asperococcus* sp., *Dictyota dichotoma*, *Chorda filum* and *Saccharina latissima*. *Cerianthus lloydii* frequent or common.
SS.SMp.KSwSS.Tra	Mats of *Trailliella* on infralittoral muddy gravel.	Mapped as a biotope complex with SS.SMp.Mrl.Pcal.R. A thick algal mat covering 70-100% of the seabed. It is likely that this mat is ephemeral, disappearing in winter storms. The underlying habitat was predominantly maerl gravel over mud. This mat of algae was a mix of a number of algal species including *Aglaothamnion* cf *tenuissimum* and *Falkenbergia*, often forming a 'fluff' around shells or maerl fragments.
SS.SMx.IMx	Infralittoral mixed sediment	The area mapped appeared to be one of rapid change between biotopes, as the bay shelved rapidly. Mixtures of sand with abundant empty shells (esp. *Ensis*) noted. Little epifauna.
SS.SMX.CMx.MysThyMx	*Mysella bidentata* and *Thyasira* spp. in circalittoral muddy mixed sediment	Characterising infauna at the sites where this biotope was recorded include: *Eumida bahusiensis, Nephtys hombergii, Prionospio fallax/ Minuspio cirrifera, Chaetozone setosa,* Maldanidae, *Urothoe elegans, Turritella communis, Cylichna cylindracea, Thyasira flexuosa, Mysella bidentata, Abra alba, Nucula* spp., various venerid bivalves and *Amphiura filiformis.*
SS.SCS.ICS.MoeVen	*Moerella* spp. with venerid bivalves in infralittoral gravelly sand	Mapped as a biotope complex. Characterising infauna included: *Cerianthus lloydii, Goniada maculata, Exogone* spp*., Nereimyra punctata, Syllidia armata, Lumbrineris gracilis, Paradoneis lyra, Apisthobranchus tullbergi, Mediomastus fragilis, Sosane sulcata, Terebellides stroemi, Polycirrus norvegicus, Pomatoceros triqueter, Verruca stroemia, Balanus balanus, Pseudoparatanais batei, Ischnochiton albus,* Anomiidae*, Parvicardium scabrum, Timoclea ovata, Dosinia lupinus, Hiatella arctica, Conopeum reticulatum* and *Moerella pygmaea*.
SS.SCS.CCS.MedLumVen	*Mediomastus fragilis*, *Lumbrineris* spp. and venerid bivalves in circalittoral coarse sand or gravel	
SS.SMx.CMx.ClloMx.Nem	*Cerianthus lloydii* with *Nemertesia* spp. and other hydroids in circalittoral muddy mixed sediment	These two biotopes occurred together, with patches of dense brittlestars. Consequently they have been mapped as one unit.
SS.SMx.CMx.OphMx	*Ophiothrix fragilis* and/or *Ophiocomina nigra* brittlestar beds on sublittoral mixed sediment	

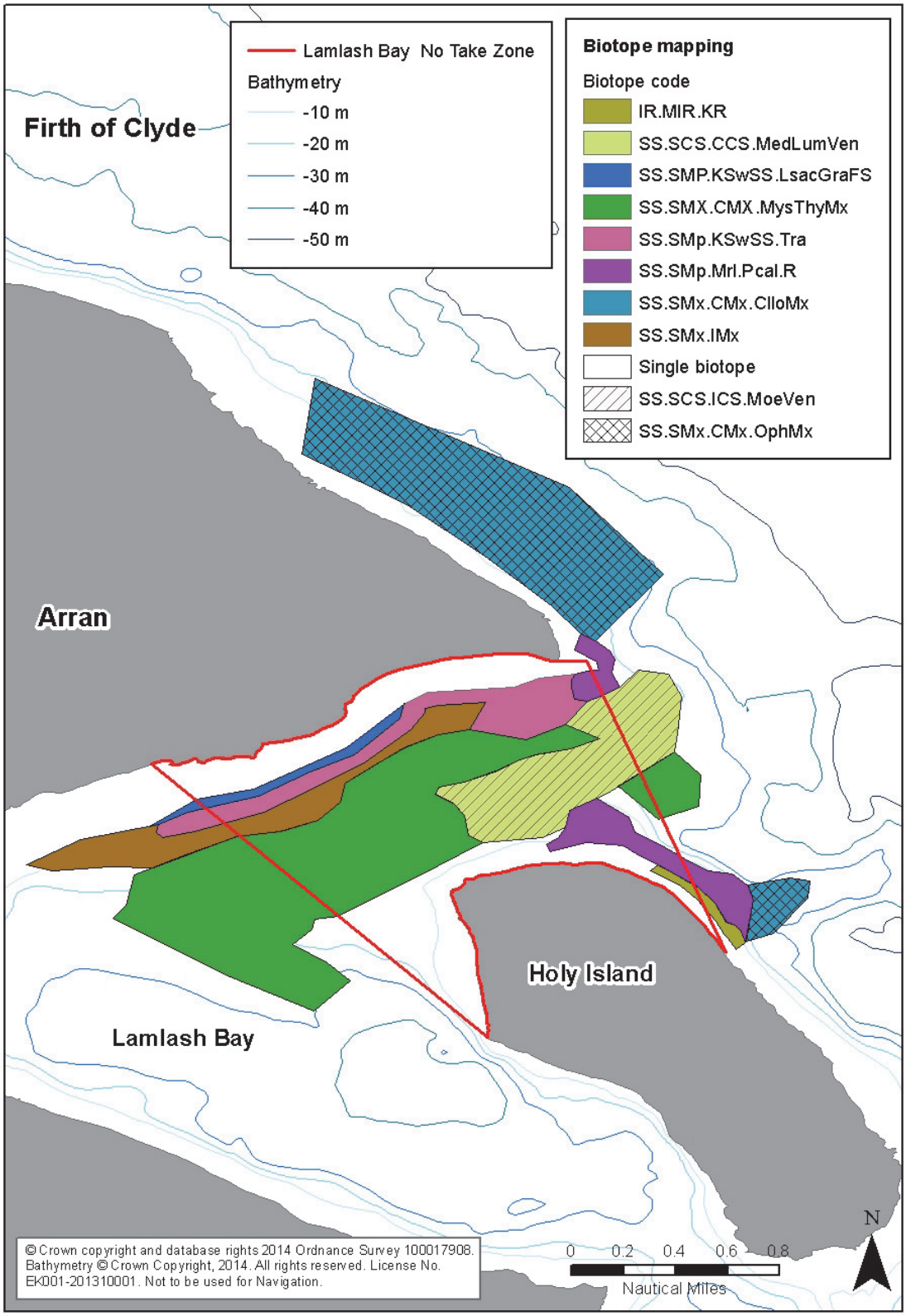

Figure 8. Predictive biotope distribution generated from the mapping exercise and other data collected during the 2010 survey. **Where polygons indicate two biotope codes these biotopes exist as a complex in these areas.**

3.2 Dive survey

Twelve dive stations were surveyed. Six were located within the NTZ and six outside of it (Figure 5). At each station three transects were surveyed and filmed. The dive transects and quadrats, and subsequent video and photograph analysis, allowed greater detail to be added to the biotopes mapped by remote video and grab. A full species list for each dive transect is provided in Appendix 1 and all data have been entered into Marine Recorder. The majority of the species present in the biotopes present were too large or thinly distributed to yield useable quantitative data from the quadrats (a notable exception was the anemone *Cerianthus lloydii*). Thus the photo-quadrats were used to better assess percentage cover of live maerl (where maerl was present) and foliose algae.

3.2.1 Dive Stations 1, 2 and 3

There was 100% maerl (**SS.SMp.Mrl.R**) cover at these sites, although at all sites the amount of live maerl was very low. The greatest amount of live maerl was recorded at Station 3 where approximately 2% was live. An unusual feature was the high numbers of *Cerianthus lloydii* within the maerl (Figure 9). However, this distribution was patchy; quadrat data yielded mean densities of 13.5 per m^2 at station 3, 155.2 per m^2 at station 2 but only 1.3 per m^2 at station 1. Large numbers of juvenile *Asterias rubens* were also recorded at these stations at the time of the survey.

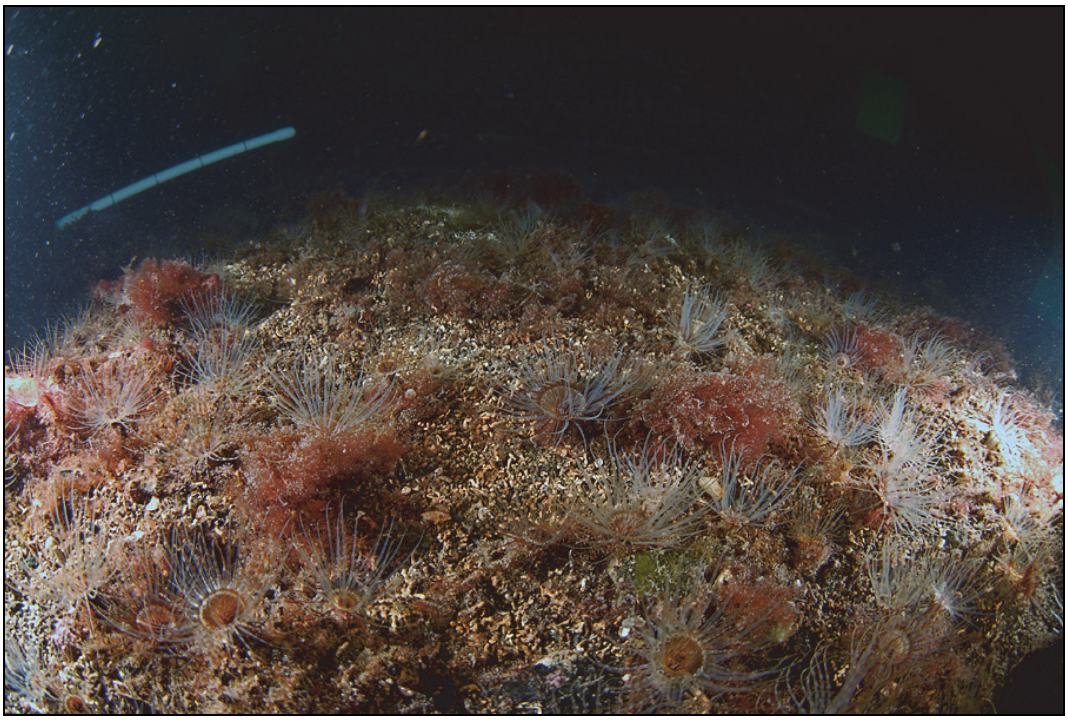

Figure 9. High densities of Cerianthus lloydii amongst maerl gravel with patchy red algal turf including Aglaothamnion sp.

3.2.2 Dive Stations 5, 6, 8 and 10

The sea bed at these stations was carpeted in a dense algal mat. The mat appeared to comprise a number of species, in particular *Aglaothamnion* cf *tenuissimum* and *Falkenbergia rufolanosa* phase of *Asparagopsis armata* (Figure 10). Numerous *Dosinia exoleta* and *Ensis* sp. shells were scattered across this mat. Beneath the mat lay a thin layer of maerl gravel with fine or muddy sand beneath. Much of the algal turf appeared as golf ball sized clumps, forming around a maerl nodule or shell. It is thought that this algal mat develops in the more sheltered shallows of the bay during the summer months. These sites were mapped as

SS.SMp.KSwSS.Tra biotope; however, without this ephemeral blanket of filamentous algae these stations would probably be considered a maerl biotope (see section 3.1, Biotope mapping). Other notable species at these stations included the parchment worm *Chaetopterus variopedatus*, *Cancer pagurus*, *Macropodia* sp., *Liocarcinus depurator*, Paguridae indet., *Marthasterias glacialis*, the butterfish *Pholis gunnelis*, *Pomatoschistus pictus*, *Pomatoschistus minutus*. Mobile species dominated the conspicuous fauna at these sites, possibly due to the blanketing effect of the algal mat.

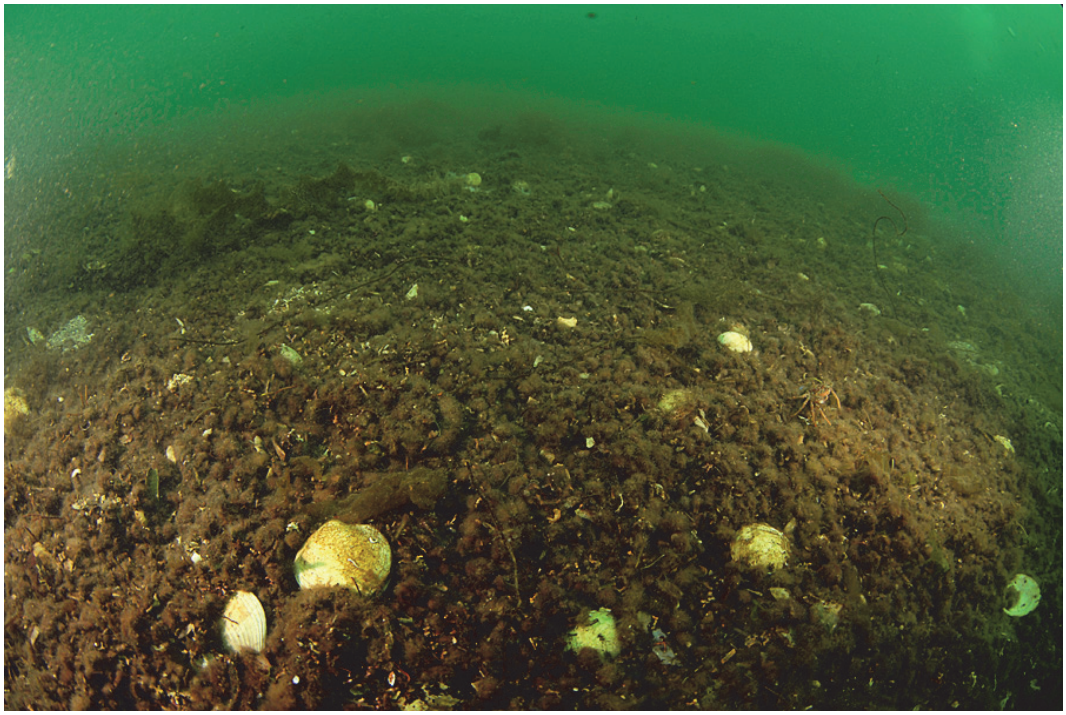

Figure 10. Station 6, dense red algal turf (including Aglaothamnion and other species), Saccharina latissima and empty Dosinia exoleta shells, maerl fragments visible under the algal turf.

3.2.3 Dive Stations 7 and 9

The sea bed at these stations consisted of clean sand with some shell and maerl fragments. Sparse *Chorda filum*, often with large amounts of Ectocarpaceae indet. attached (Figure 11), also some *Chaetopterus variopedatus* tubes and some *Arenicola* casts. Siphons, thought to be *Ensis* sp., were frequently seen at both stations. *Pomatoschistus pictus* and *Pomatoschistus minutus* were also frequent.

3.2.4 Dive Stations 4 and 11

Dive stations 4 and 11 were classified as biotope **SS.SCS.ICS.MoeVen**, *Moerella* spp. with venerid bivalves in infralittoral gravelly sand. The sea bed at station 4 was significantly coarser than at station 11, being composed mostly of shell gravel, with clumps of red algal turf (*Aglaothamnion* and other species) and sparse *Chorda filum* (Figure 12). The edible crabs *Cancer pagurus* and *Pagurus bernhardus* were frequent and *Cerianthus lloydii* was occasional. Juvenile *Asterias rubens* were common. One individual of the burrowing anemone *Peachia cylindrica* was also noted. The sediment appeared highly bioturbated by edible crabs. Some small boulder outcrops with *Saccharina latissima*, coralline crusts and grazing *Echinus* were also encountered. The sediment at station 11 was described as muddy, gravelly sand with some shell fragments. Very little epibiota was noted here, although it appeared well bioturbated. Siphons, thought to be *Ensis*, were noted as

occasional. *Pomatoschistus pictus* and *Pomatoschistus minutus* were also frequent. Due to the paucity of epibiota, this site was assigned a biotope based on the infaunal analysis alone.

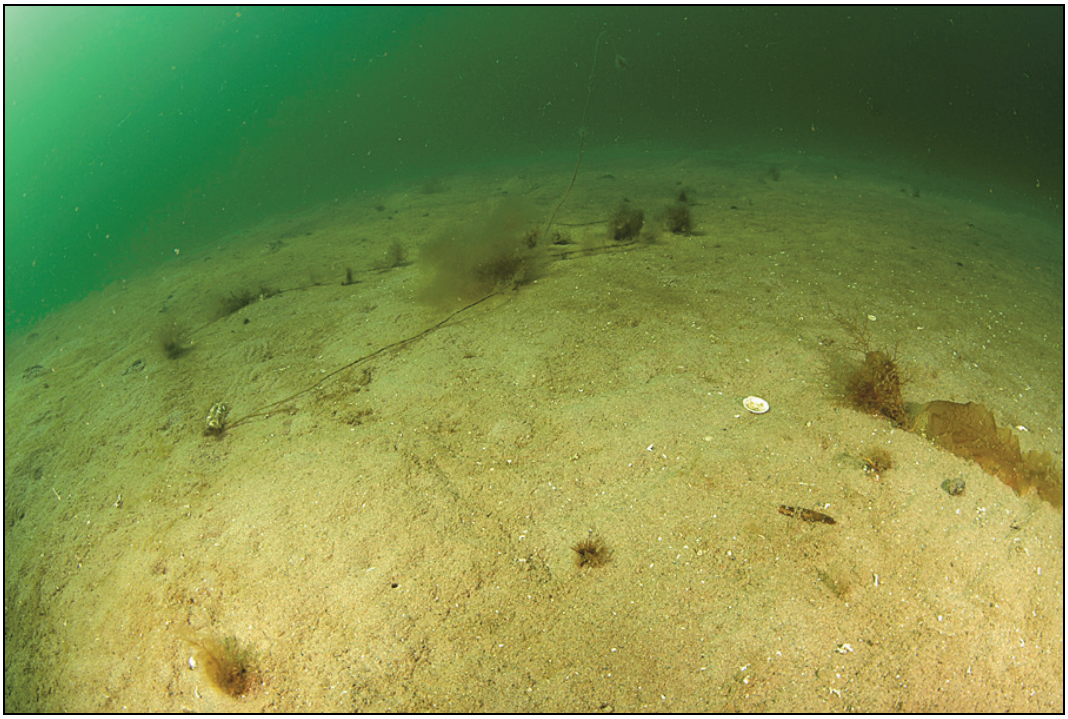

Figure 11. Dive station 9, clean sand with some shell and maerl fragments, sparse Chorda filum, often with large amounts of Ectocarpaceae indet. attached.

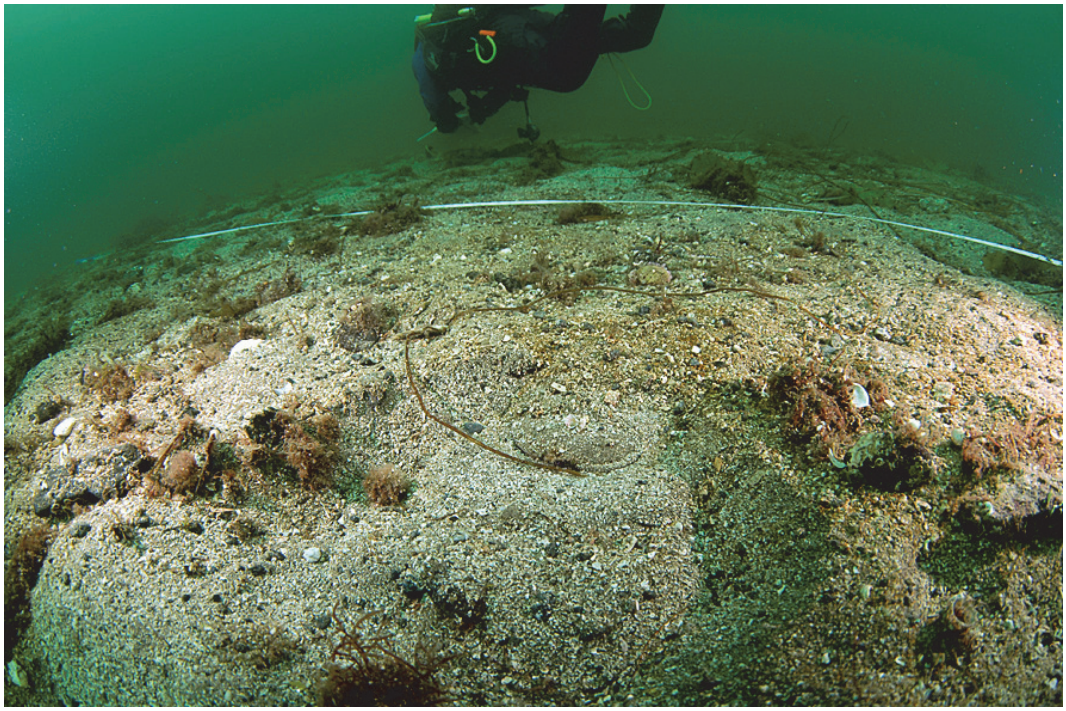

Figure 12. Dive station 4, shell gravel, with clumps of red algal turf (Aglaothamnion and other species) and sparse Chorda filum. The seabed appeared highly bioturbated by edible crabs.

3.2.5 Dive Station 12

This site consisted of boulders and bedrock outcrops with dead maerl gravel between (Figure 13), thus was a matrix of two biotopes, **SS.SMp.KSwSS.LsacR.CbPb** and **SS.SMp.Mrl.Pcal.R**. The boulder and bedrock outcrops were covered in kelp and red algae, notably *Saccharina latissima*, *Chorda filum*, *Polyides rotundus*, *Chondrus crispus* and *Dilsea carnosa*. This was considered to be the biotope **SS.SMp.KSwSS.LsacR.CbPb**, red seaweeds and kelps on tide-swept mobile infralittoral cobbles and pebbles. The maerl gravel habitat between the boulders and bedrock was essentially the same as the maerl biotope identified at nearby dive stations 1, 2 and 3. *Cerianthus lloydii* was frequent (but not in such high densities as Stations 2 and 3) *Chaetopterus variopedatus* was occasional. *Marthasterias glacialis* was recorded as frequent along all three transects at this station. Sparse *Chorda filum*, *Saccharina latissima* and patchy filamentous red algae, including *Aglaothamnion* sp. (probably *A. byssoides*), covered the maerl gravel, attached to stones and shells. This was identified as biotope **SS.SMp.Mrl.Pcal.R**, *Phymatolithon calcareum* maerl beds with red seaweeds in shallow infralittoral clean gravel or coarse sand.

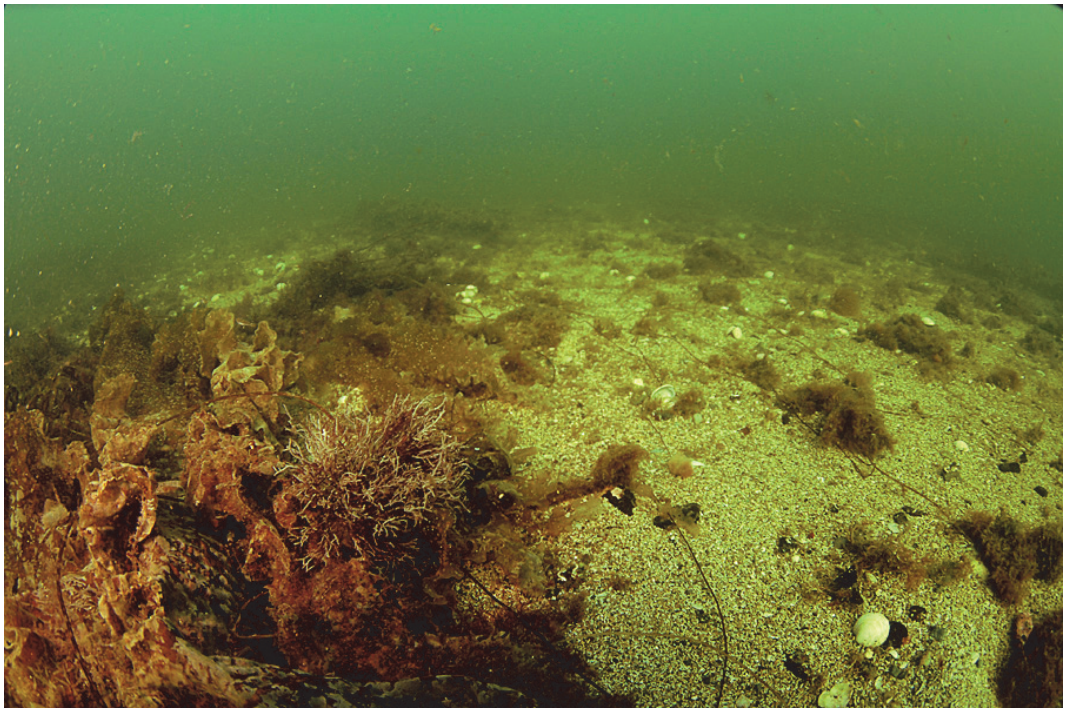

Figure 13. Dive station 12 consisted of boulders and bedrock outcrops with dead maerl gravel between, thus was a matrix of two biotopes.

3.2.6 Statistical analysis of epibiota recorded on dive transects

The relationships between the epibiota recorded in the dive transects were investigated using the statistical package PRIMER v 6.1.12 (Clarke & Warwick, 2001; Clarke & Gorley, 2006). All taxa recorded by the divers were used in the analysis. The photo-quadrats proved too small to provide useable quantitative data for most of the epifauna and flora present across the range of biotopes encountered and so were not used for this analysis. Inter-sample resemblances were calculated using the Bray-Curtis similarity index which is widely used for biological data particularly where there are species-poor assemblages (Clarke *et al*., 2006). Results of the analysis are provided as cluster analysis and MDS plots. In general the transects (sub samples) at each site plotted together at the 60% level of similarity; individual biotopes plotted together (with some exceptions) at the 35% level (Figure 15). Cluster analysis at 35% similarity is illustrated in Figure 16.

A 2-way nested analysis of variance (Primer routine ANOSIM) was carried out on the resemblance matrix for the dive transect data excluding the additional stations S2 and S3. The following hypotheses were tested where stations are dive locations each with three replicates (transects) and treatment is either inside or outside the NTZ.

- H1 - there is **no difference** between station groups across both treatment groups (inside and outside the NTZ);

- H2 - there is **no difference** between treatment groups using station groups as samples (station groups being all three transects for each station, inside and outside of the NTZ).

The methodology used followed that described in Clarke & Warwick (2001).

- Test of differences between station/site groups (H1):

  R=0.987 at a significance level of 0.1%
  H1 is rejected (i.e. there is a significant difference between station group across both treatment groups).

- Test of difference between treatment groups (H2):

  R=0.141 at a significance level of 17.1%
  H2 is accepted, (i.e. there is no significant difference between treatment groups). This is not unexpected at this early stage in the establishment of the NTZ.

Because of the nature of the data collected from the three transects at each dive station, it is not possible to compare species diversity indices between treatments (inside and outside the NTZ). In order to derive these indices numerical data are required; the data from the dive transects are based on a six point abundance scale.

Figure 14 illustrates the high degree of similarity across all three transects within stations and a high degree of similarity across all transects within individual biotopes. The same data plot is re-labelled in Figure 15, illustrating that no marked differences are apparent between similar biotopes within and outside the NTZ.

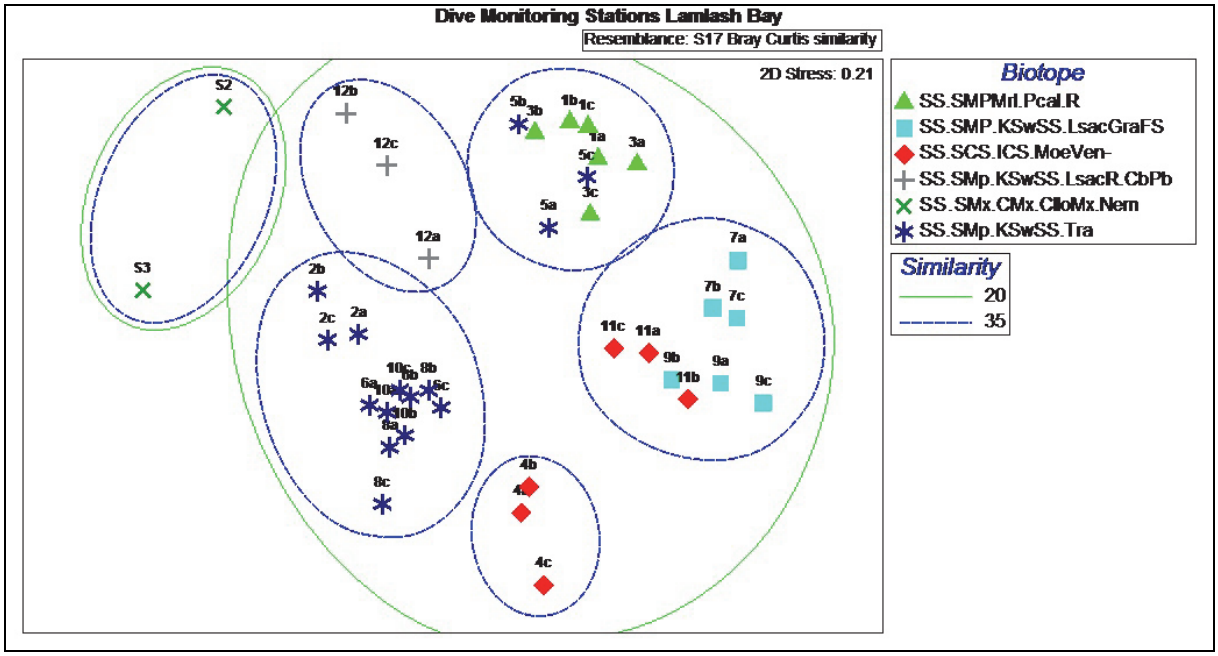

Figure 14. Dive data, similarity labelled by station and transect replicate.

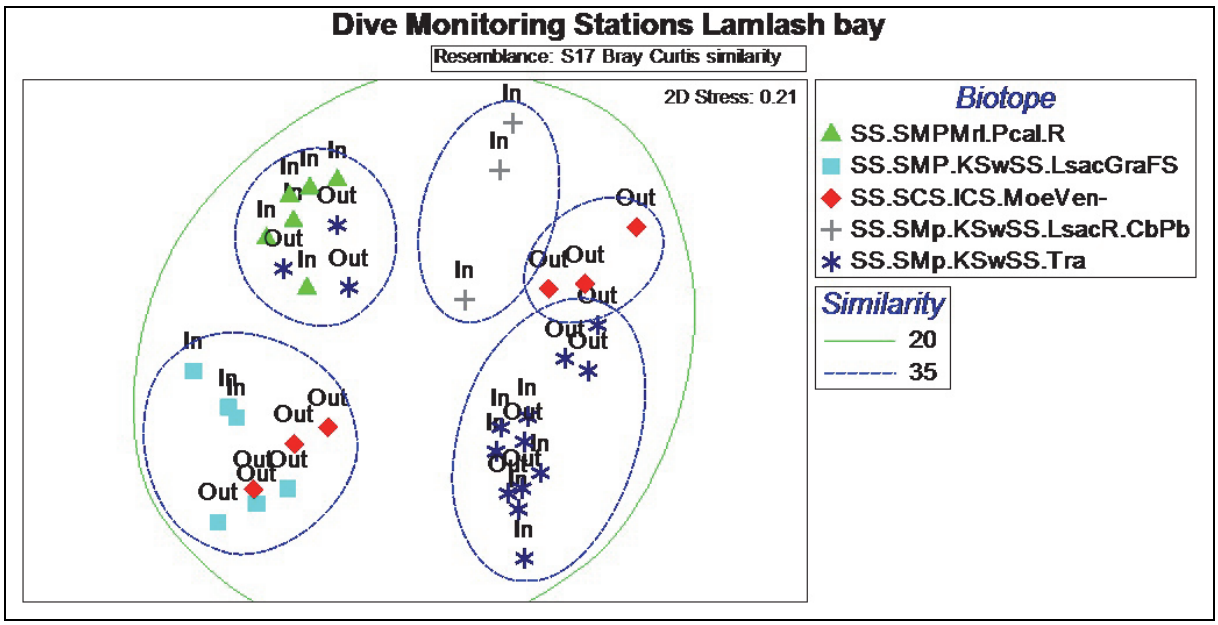

Figure 15. Dive data, similarity labelled by treatment (inside or outside the NTZ).

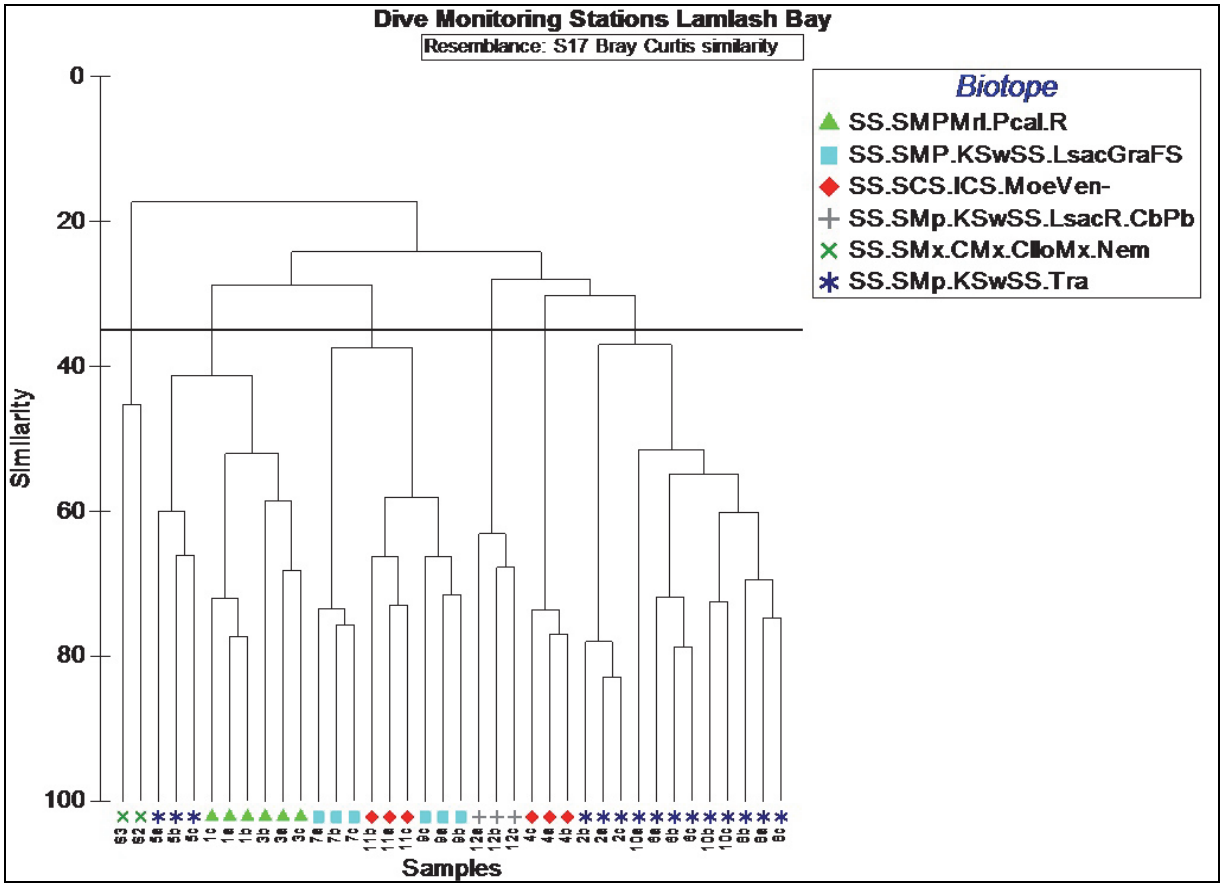

Figure 16. Dive data, cluster analysis Bray Curtis similarity at 35% level.

3.3 Infaunal analysis

Benthic invertebrates were identified from 12 Van Veen grab samples (each 0.025 m^2) and 12 cores (each about 0.0085 m^2) collected by divers. In total 8598 specimens (excluding colonial species) were identified from the 24 samples. The total number of taxa recorded was 422, of which 418 were invertebrates and four were algae. The full results are shown in Appendix 2.

In some of the grab samples the number of taxa was much higher than others. The grab samples had 65 – 143 taxa per sample (mean 91.4 taxa per grab). As would be expected, fewer taxa were recorded in the core samples, as they were only about 1/3 of the area of the grab samples. The cores had 4 – 82 taxa per sample (mean 36.9). The number of individuals per sample in the grabs ranged from 268 – 733 (mean 538). In the core samples the number of individuals per sample ranged from 4 – 661 (mean 178). The mean number of invertebrates per square metre was similar in grabs (21,537 m^{-2}) and cores (21,013 m^{-2}). These mean densities are higher than expected for this habitat.

Cluster analysis and Multi-Dimensional Scaling (MDS) analysis was carried out on the full data set and with the grab and core data separated. Figure 17 shows the results of cluster analysis of all 24 sites. Core samples were labelled by their GIS generated object ID (OBID); OBID 1, 4, 6, 8, 9, 10, 13, 14, 15, 16 & 17. Note that in the statistical analyses OBID4 is shown as LOC 4 and OBID6 is shown as LOC 3. Table 2 relates OBID numbers to the dive station numbers given with the statistical analysis. As would be expected the core sites and grab sites form groups within the sample type before finally joining (Figure 17). The same effect is clear in Figure 18, which shows the MDS analysis of the core and grab sites. Note

that in Figure 17 the grab samples form a tighter grouping than the core samples. This is due to the grab samples containing many taxa in common with other grab samples.

Data for the core samples and grab samples were then analysed separately. Figure 19 shows the results of MDS analysis of the grab samples, using the full data set and log transformed densities. Two main groupings are described below.

3.3.1 Grab sampling sites GM1, 2, 4, 5 and 6

Sites GM4, 5 and 6 were gravelly-sand sites that supported a very high number of taxa (108 – 143 taxa per grab). Particle size data for GM4 and GM6 (no data available for GM5) showed they had the highest gravel content of all the grab samples and the lowest silt and clay content. Site GM2 had the next highest gravel content. Microscopic analysis of the dense fraction showed the following:

- GM4: a large amount of retained material, mainly sand, dead maerl, broken shell and some larger stones.
- GM5: a small to moderate amount of retained material, mainly broken shell with some larger pieces of shell & occasional clinker.
- GM6: a moderate amount of retained material, mainly shell gravel and encrusted cobbles and shell sand, some dead maerl and some quartz and clinker.

Characterising taxa at GM1, 2, 4, 5 and 6 included: *Cerianthus lloydii, Goniada maculata, Exogone* spp*., Nereimyra punctata, Syllidia armata, Lumbrineris gracilis, Paradoneis lyra, Apisthobranchus tullbergi, Mediomastus fragilis, Sosane sulcata, Terebellides stroemi, Polycirrus norvegicus, Pomatoceros triqueter, Verruca stroemia, Balanus balanus, Pseudoparatanais batei, Ischnochiton albus,* Anomiidae*, Parvicardium scabrum, Timoclea ovata, Dosinia lupinus, Hiatella arctica, Conopeum reticulatum* and *Moerella pygmaea* (at GM4 and GM6).

Notable absences (or very low densities) compared to the other grab sampling sites were: *Nephtys hombergii, Prionospio fallax/Minuspio cirrifera, Mysella bidentata, Cylichna cylindracea* and *Amphiura filiformis.*

The best match with JNCC biotopes (with edited JNCC biotope descriptions given in boxes) is either:

SS.SCS.CCS.MedLumVen *Mediomastus fragilis*, *Lumbrineris* spp. and venerid bivalves in circalittoral coarse sand or gravel

> "Circalittoral gravels, coarse to medium sands, and shell gravels, sometimes with a small amount of silt and generally in relatively deep water (generally over 15-20m), may be characterised by polychaetes such as *Mediomastus fragilis, Lumbrineris* spp., *Glycera lapidum* with the pea urchin *Echinocyamus pusillus*. Other taxa may include Nemertea spp., *Protodorvillea kefersteini, Owenia fusiformis, Spiophanes bombyx* and *Amphipholis squamata* along with amphipods such as *Ampelisca spinipes*. This biotope may also be characterised by the presence of conspicuous venerid bivalves, particularly *Timoclea ovata*. Other robust bivalve species such as *Moerella* spp., *Glycymeris glycymeris* and *Astarte sulcata* may also be found in this biotope. *Spatangus purpureus* may be present especially where the interstices of the gravel are filled by finer particles, in which case, *Gari tellinella* may also be prevalent. Venerid bivalves are often under-sampled in benthic grab surveys and as such may not be conspicuous in many infaunal datasets. Such communities in gravelly sediments may be relatively species-rich and they may also contain epifauna such as *Hydroides norvegicus* and *Pomatoceros lamarcki*. In sand wave areas this biotope may also contain elements of the FfabMag biotope, particularly *Magelona* species. This biotope has previously been described as the 'Deep *Venus* Community' and the 'Boreal Off-Shore Gravel Association' by other workers and may also be part of the Venus community described by Thorson and in the infralittoral etage described by Glemarec. SCS.MedLumVen may be quite variable over time and in fact may be closer to a biotope complex in which a number of biotopes or sub-biotopes may yet be defined".

or

SS.SCS.ICS.MoeVen *Moerella* spp. with venerid bivalves in infralittoral gravelly sand

> "Infralittoral medium to coarse sand and gravelly sand which is subject to moderately strong water movement from tidal streams may be characterised by *Moerella* spp. with the polychaete *Glycera lapidum* (agg.) and venerid bivalves. Typical species include *Moerella pygmaea* or *M. donacina* with other robust bivalves such as *Dosinia lupinus*, *Timoclea ovata*, *Goodallia triangularis* and *Chamelea gallina*. Other infauna include nephtyd and spionid polychaetes and amphipod crustacea. In conjunction with FfabMag this biotope may form part of the 'Shallow *Venus* Community', the 'Boreal Off-shore Sand Association' and the '*Goniadella-Spisula* association' of previous workers. Remote grab sampling is likely to under-estimate venerid bivalves and other deep-burrowing and more dispersed species such as *Paphia*, *Ensis* and *Spatangus"*.

Site GM1 had the lowest number of individuals of any of the grab sites. It did not closely match the group of three sites GM4, 5 and 6 in Figure 19 but our assessment of the data in Table 3 suggests that this site had many similarities (e.g. absence of *Amphiura filiformis*, low density of *Mysella bidentata*, similar densities of the venerid *Timoclea ovata* and barnacles). However, no *Moerella* spp. were in the sample. Site GM1 appears to be a good match with **SS.SCS.CCS.MedLumVen**.

Site GM2 was also an outlier in the MDS analysis (Figure 19 but appears more similar to GM4, 5, 6 and 1 than to the other main grouping described below. It contained relatively high densities of the venerid bivalves *Chamelea gallina* and *Dosinia lupinus*, plus low densities of *Mediomastus fragilis* and *Lumbrineris gracilis.* No *Moerella* spp. were found in the sample. GM2 appears to be either **SS.SCS.ICS.MoeVen** or **SS.SCS.CCS.MedLumVen**.

It is likely that sites GM1, 2, 4, 5 and 6 will show subtle changes in composition over time and should be grouped together as **SS.SCS.CCS.MedLumVen** and **SS.SCS.ICS.MoeVen**. They are therefore grouped as a biotope complex.

3.3.2 Grab sampling sites GM3, 7, 8, 9, 11 and 12

Particle size data were obtained for GM8 and GM12, which were both slightly gravelly sand. Microscopic analysis of the dense fraction showed the following:

- **GM3:** a small to moderate amount of dense material, mainly broken shell and brittlestar arms, with some quartz and occasional slag.

- **GM7:** a small amount, mainly live *Turritella communis* plus sand and dead broken shell and some coal.

- **GM8:** a very small amount, mainly brittlestar legs with some sand, some coal and many dead shells plus live *Turritella communis*.

- **GM9:** a very small amount, mainly sand and dead shells with some live *Turritella communis*.

- **GM11:** a very small amount, mainly sand and coal with some dead shells and many live *Turritella communis*.

- **GM12:** a small to moderate amount, mainly live *Turritella communis* and polychaete sand tubes plus sand and dead shell and a small amount of coal.

Characterising taxa included: *Eumida bahusiensis, Nephtys hombergii, Prionospio fallax/Minuspio cirrifera, Chaetozone setosa,* Maldanidae, *Urothoe elegans, Turritella communis, Cylichna cylindracea, Thyasira flexuosa, Mysella bidentata, Abra alba, Nucula* spp., various venerid bivalves and *Amphiura filiformis.*

The best match appears to be **SS.SMX.CMx.MysThyMx *Mysella bidentata* and *Thyasira* spp. in circalittoral muddy mixed sediment**. The JNCC description of this biotope is:

> "In moderately exposed or sheltered, circalittoral muddy sands and gravels a community characterised by the bivalves *Thyasira* spp. (often *Thyasira flexuosa*), *Mysella bidentata* and *Prionospio fallax* may develop. Infaunal polychaetes such as *Lumbrineris gracilis*, *Chaetozone setosa* and *Scoloplos armiger* are also common in this community whilst amphipods such as *Ampelisca* spp. and the cumacean *Eudorella truncatula* may also be found in some areas. The brittlestar *Amphiura filiformis* may also be abundant at some sites. Conspicuous epifauna may include encrusting bryozoans *Escharella* spp. particularly *Escharella immersa* and, in shallower waters, maerl (*Phymatolithon calcareum*), although at very low abundances and not forming maerl beds."

3.3.3 Core samples

The core samples were not as closely grouped as the grab samples. This may be partly due to large differences in the number of taxa recorded (range 4 – 82 taxa). In addition, the relatively small sample size will have reduced the chance of recording species present at a site. It is likely that the main group of core sites in Figure 15 (towards the top of the figure) is a mixture of **SS.SCS.CCS.MedLumVen** and **SS.SCS.ICS.MoeVen**. The JNCC description for biotope **SS.SCS.CCS.MedLumVen** suggests it is restricted to water deeper than 15-20 m, so perhaps the best overall match for these core sites is **SS.SCS.ICS.MoeVen** *Moerella* spp. with venerid bivalves in infralittoral gravelly sand.

The other three core sites in Figure 18 had very few taxa present (range 4-11). At dive station 7 and dive station 9 some venerid bivalves were recorded and they may be considered part of the **SS.SCS.ICS.MoeVen** biotope, even though no specimens of *Moerella*

were present in the core samples. This may just be due to small sample size and lower densities of *Moerella* at these two sites. Dive station 10 had only had single specimens of four taxa and could not be matched with any JNCC biotopes.

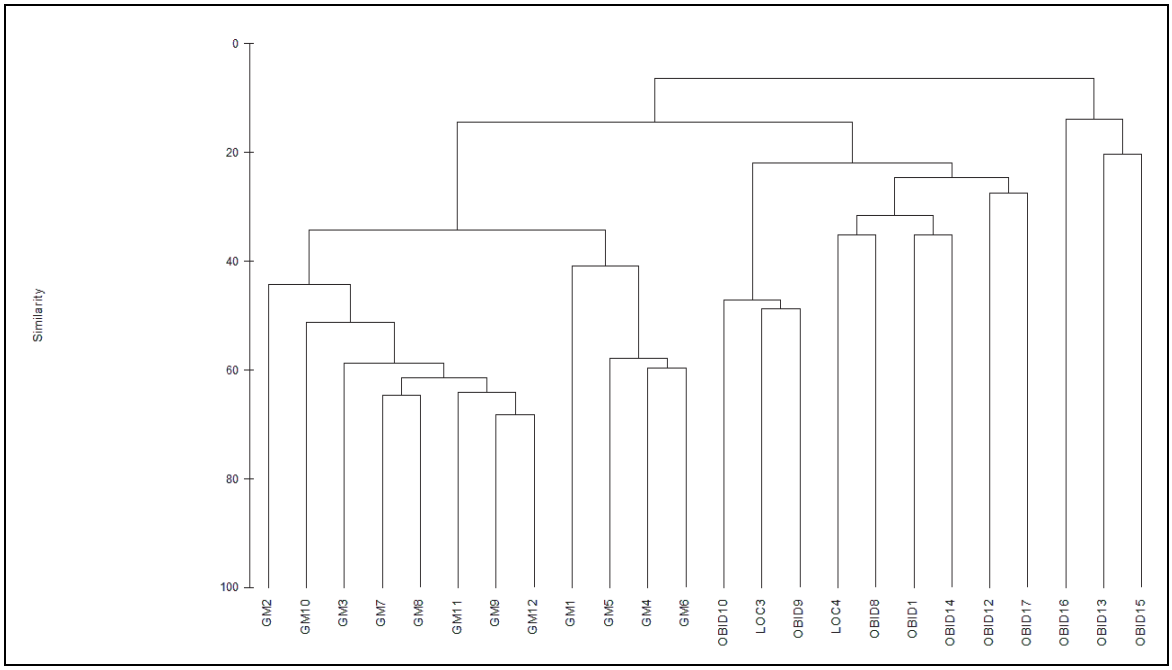

Figure 17. Cluster analysis of infauna for all 12 grab samples and 12 cores. Log transformed data. Note: core samples were labelled by their GIS generated object ID (OBID); OBID 1, 4, 6, 8, 9, 10, 13, 14, 15, 16 & 17. The corresponding dive station number is given in Table 2, below.

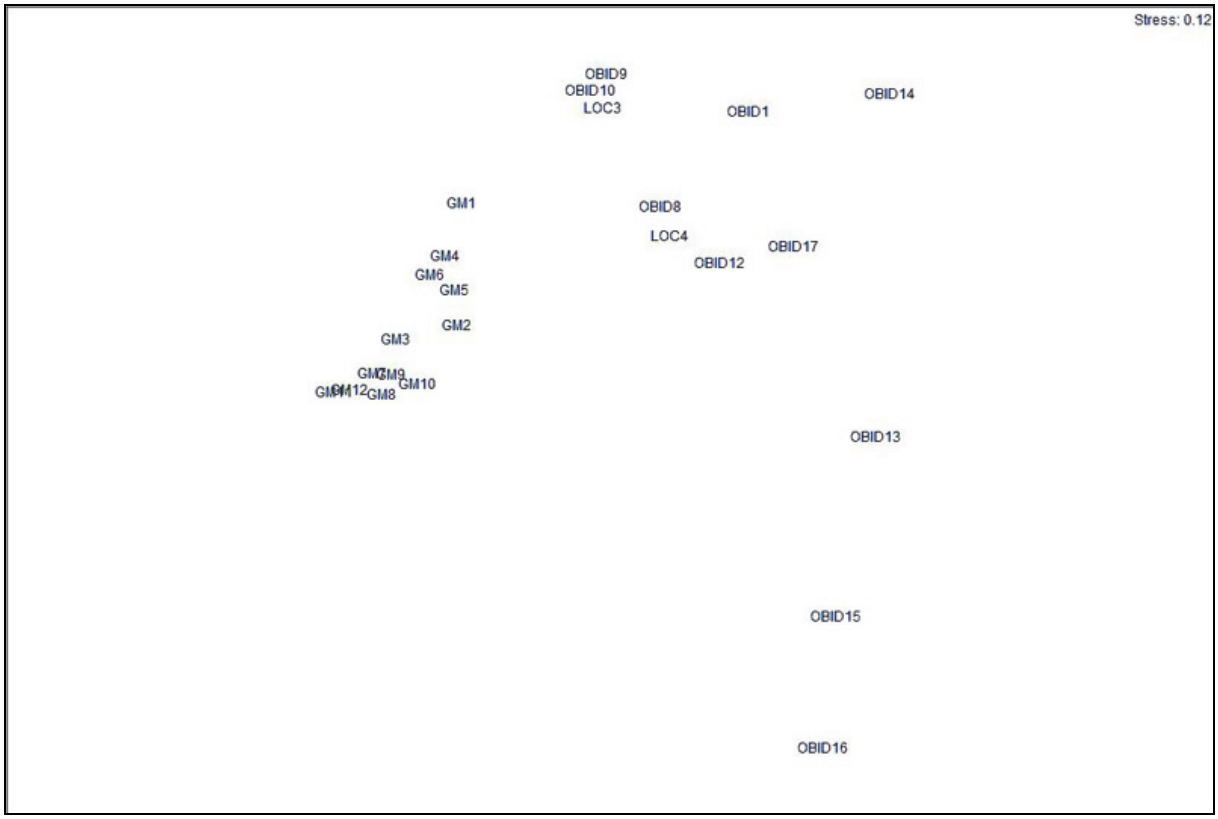

Figure 18. Multi-Dimensional Scaling (MDS) of all infauna samples for all taxa. Log transformed data.

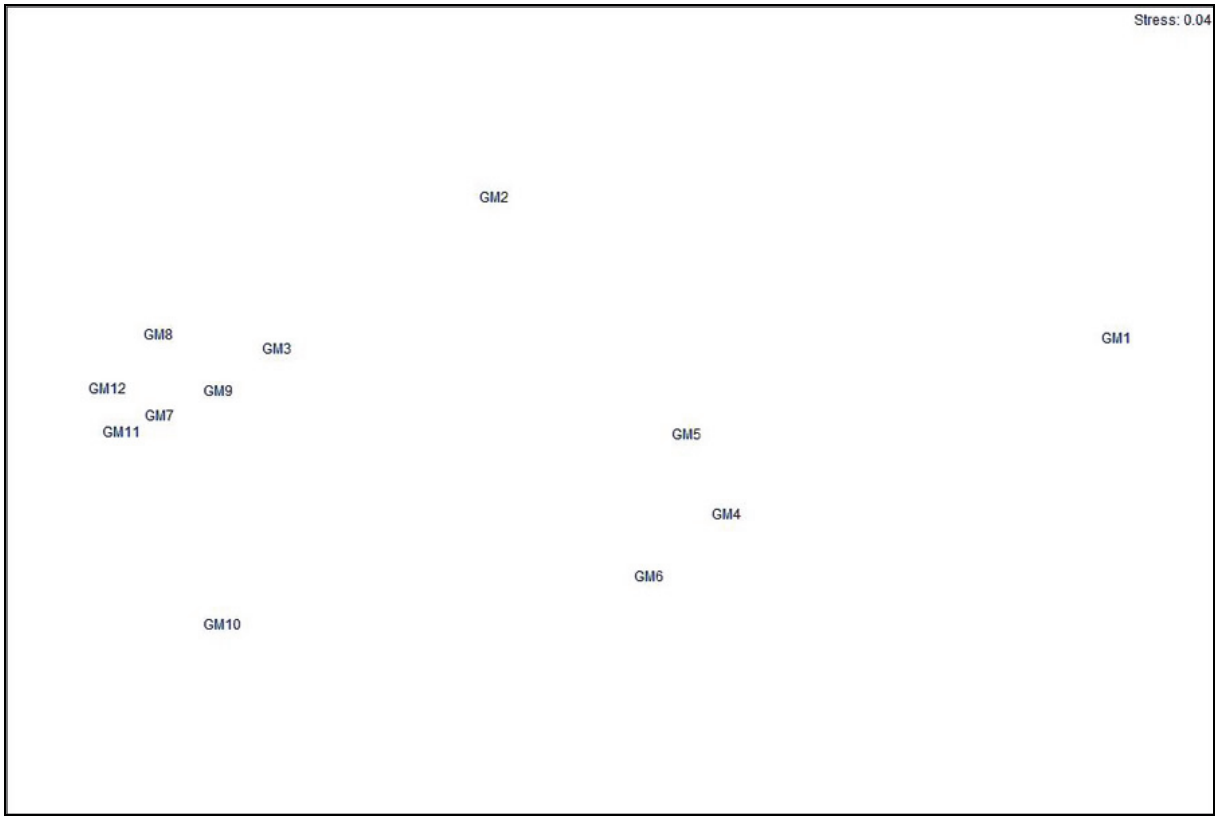

Figure 19. MDS analysis of all grab samples for all taxa. All data log transformed.

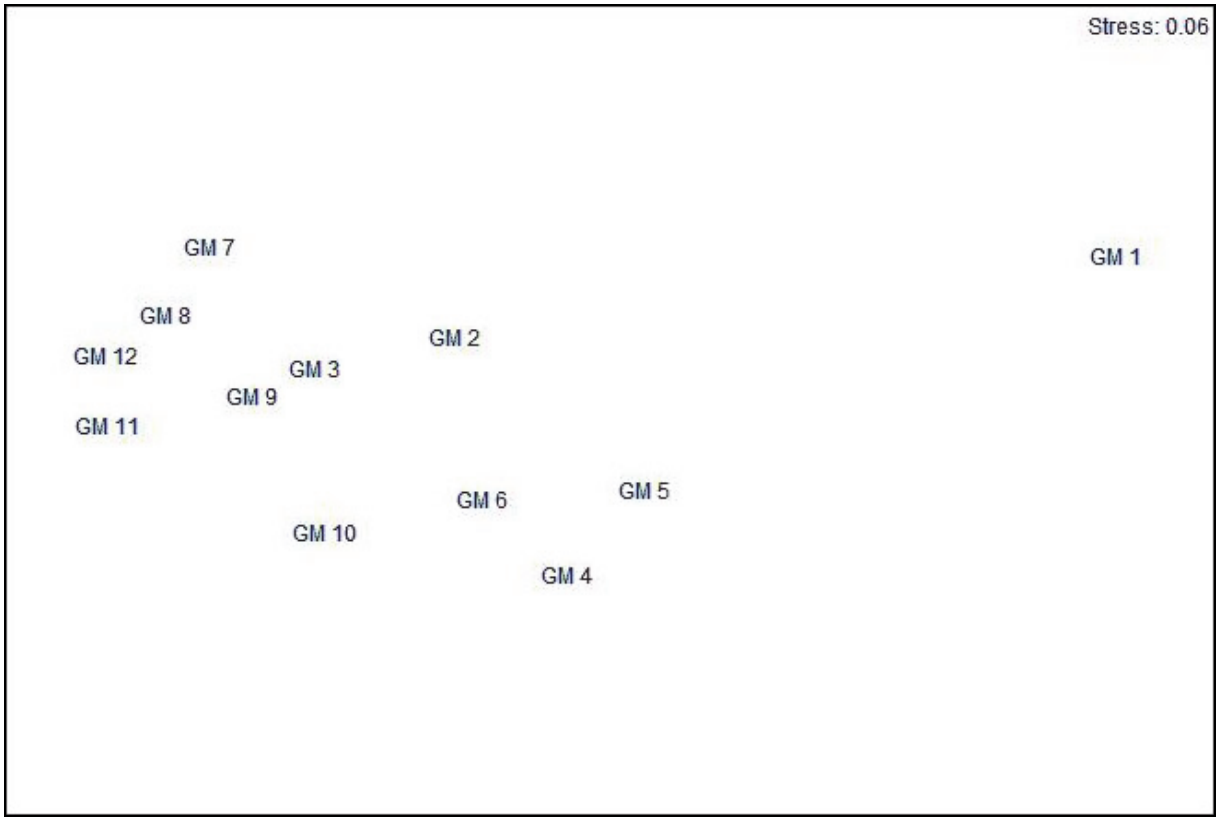

Figure 20. MDS analysis of all grab samples for 31 most common taxa. All data log transformed.

Table 2. Dive station number and the corresponding GIS Object ID used in cluster analysis

Dive Station No.	GIS Object ID used in Cluster analysis
1	6 (Loc 3)
2	4 (Loc 4)
3	10
4	12
5	8
6	1
7	13
8	14
9	15
10	16
11	17
12	9

3.3.4 Ubiquitous and common taxa

A few taxa were relatively common at many grab sites and core sites. For example 31 taxa were found at >45% of sampling sites (Table 3). These 31 taxa accounted for 4834 individuals, or 56% of the total from all 422 taxa. To examine whether the most ubiquitous taxa could be used to discriminate between the biotopes we recorded in the grab sampling sites we undertook an MDS analysis of the reduced data set (Figure 20). This showed a similar pattern to the full data set, but with poor separation of the two main biotopes.

3.3.5 Comparisons with the 2008-09 survey

It is difficult to make precise comparisons between the data from the 2010 surveys and those carried out in the same area during 2008 and 2009 (Axelsson *et al.*, 2010). The main data table in Axelsson *et al.* (2010) contains many taxa for which the location they were recorded was not given. There was, however, good agreement between the dominant taxa in the present survey and that undertaken in 2008 and 2009 (Axelsson *et al.*, 2010). Despite the fact that we only examined a total of 0.402 m^2 (cf 1.0 m^2 in 2008-09) this survey recorded many more invertebrate taxa (418 cf 256 in 2008-09). The higher number of taxa in the 2010 survey was probably due to the combination of several factors:

1. This survey used a 0.5 mm mesh rather than a 1.0 mm mesh;
2. Samples in this survey came from a wider range of depths and substrates;
3. Markedly more taxa were identified in this survey in some difficult groups such as turbellarians (flatworms), nemerteans (ribbon worms), small gastropods and bryozoans (sea mats).

3.3.6 Unusual and interesting taxa

Although a large number of taxa were recorded from the grab samples and core samples, most were common species in UK waters. Of the remainder, some are likely to be relatively common but under-recorded due to their small size or similarity to a closely related more common species. Although a large number of *Modiolus modiolus* were recorded, all were juveniles, which are widely distributed on suitable substrates in UK waters. There was no evidence from the video, grab or core samples of any beds of *Modiolus modiolus*. Amounts of maerl in the samples were lower than expected. None of the grab or core samples are from biotopes that could be classified as maerl beds.

Interesting and unusual species recorded in the survey included:

- *Tetrastemma robertianae* McIntosh, 1874; single specimens of this distinctive nemertean were found at sites GM2, GM4 and Dive Station 4;

- *Sphaerodoridium fauchaldi* Hartmann-Schröder, 1993; this sphaerodorid polychaete was described recently (1993) from the North Sea and therefore is likely to be under-recorded. In the 2010 survey single specimens were recorded at GM3 and GM7, two specimens at GM10 and GM12 and three specimens at GM9;

- *Malmgrenia ljungmani* Malmgren, 1867; this scaleworm is rarely recorded in Scottish waters. It was found at sites OBID6 and OBID10;

- *Chaetoderma nitidulum* Lovén, 1844; two specimens at Site GM2 (Figure 21) although not particularly rare, this species belongs to a little known class of molluscs known as Caudofoveata;

- *Leptochiton cancellatus* Sowerby, 1840; two specimens of this chiton at OBID6;

- *Ischnochiton albus*; single specimens of this chiton were found at GM2, GM4, GM5, OBID9 and OBID10; three specimens at GM6;

- *Margarites groenlandicus* Gmelin, 1791; a rarely recorded gastropod mollusc, near its southern distributional limit in the UK at Arran. A single specimen was recorded from OBID8;

- *Jujubinus clelandi* Wood, 1828; also known as *Clelandella miliaris* Brocchi, 1814; a single specimen of this gastropod was found at GM2.

- *Raphitoma boothii* J. Smith, 1839; also known as *Raphitoma concinna* Scacchi, 1836; a single specimen of this small gastropod at GM1.

- *Labidoplax buskii* McIntosh, 1866; this holothurian is not often recorded in the UK. It was found at GM3 (two specimens) and GM9 (three specimens).

Note that many of these more unusual taxa were found either just within the NTZ at the NE corner (GM4, GM5, GM6, Dive stations 12 and 3), or in the same general area but just outside the NTZ (GM2, GM3, Dive stations 5 and 4).

Figure 21. A specimen of Chaetoderma nitidulum from grab station GM2, and example of the little known Caudofoveata class of molluscs.

Table 3. Most commonly recorded taxa in grabs and cores (in >45% of all samples) in order of total abundance. Asterisks denote taxa that were also common in the 2008-09 survey (Axelsson et al., 2010).

MCS Code		Latin Name	Total	No of sites	% of sites	No of grab sites	No of core sites
W	1906	*Mysella bidentata* *	879	18	75.0	12	6
W	1702	*Modiolus modiolus*	637	21	87.5	12	9
P	1098	*Owenia fusiformis**	431	15	62.5	12	3
P	765	*Prionospio fallax** & *Minuspio cirrifera*	539	13	54.2	12	1
ZB	154	*Amphiura filiformis**	247	11	45.8	9	2
P	1093	*Galathowenia oculata*	209	12	50.0	11	1
P	919	*Mediomastus fragilis**	174	18	75.0	9	9
P	1107	*Lagis koreni*	170	13	54.2	12	1
ZA	5	*Phoronis muelleri*	155	13	54.2	12	1
W	2227	*Thracia* spp. (juv) (indet)	136	17	70.8	11	6
P	94	*Pholoe synophthalmica**	132	21	87.5	11	10
W	1837	*Thyasira flexuosa**	131	12	50.0	11	1
ZB	161	*Amphipholis squamata*	120	16	66.7	11	5
P	699	*Paradoneis lyra*	98	11	45.8	11	0
P	788	*Spio armata*	89	13	54.2	11	2
G	1	Nemertea (indet)*	88	13	54.2	10	3
P	776	*Pygospio elegans*	73	13	54.2	12	1
W	1952	*Parvicardium scabrum*	67	11	45.8	4	7
W	2128	*Dosinia lupinus**	67	14	58.3	7	7
S	423	*Ampelisca* sp. (indet)	55	12	50.0	11	1
W	2023	*Moerella pygmaea*	54	12	50.0	3	9
P	796	*Spiophanes kroyeri*	50	11	45.8	11	0
P	579	*Lumbrineris gracilis**	48	13	54.2	10	3
P	421	*Exogone hebes*	47	14	58.3	12	2
P	846	*Tharyx killariensis*	46	12	50.0	10	2
D	766	*Edwardsia claparedii*	44	13	54.2	10	3
P	118	*Eteone longa*	41	15	62.5	11	4
P	422	*Exogone naidina*	36	12	50.0	9	3
P	494	*Nephtys* spp. (indet)*	36	11	45.8	11	0
P	971	*Praxillella affinis*	32	11	45.8	11	0
W	2095	*Gouldia minima*	30	11	45.8	8	3
		Total individuals	4961				

3.3.7 Comparison of data from stations inside and outside the NTZ

The number of species, total number of individuals, various measures of diversity and evenness of diver cores and grab samples have been compared between the No-Take Zone (NTZ) and outside the NTZ. Diversity and evenness measures examined were all calculated using Primer ® software:

- d: Margalef's species richness
- ES(20) : Number of taxa expected if 20 specimens chosen at random from all present
- H'(loge): Shannon diversity index
- J': Pielou's Evenness

The statistical analysis compared data from sites inside and outside the NTZ for:

- Grab sampling sites in Biotope 1 **SMX.CMx.MysThyMx** *Mysella bidentata* and T*hyasira* spp.
- All grab sampling sites combined
- All core samples combined (excluding Site 10 which had only four specimens and four taxa and was considered an outlier). Apart from Site 10, all core sites matched the JNCC biotope **SS.SCS.ICS.MoeVen**

The results for Biotope 2 (which was intermediate between **SS.SCS.CCS.MedLumVen** and **SS.SCS.ICS.MoeVen**) were not analysed as there were only two sampling sites outside the NTZ.

Initially, normality tests and equal variance tests were run on each data set. If these tests were passed then t-tests were used to compare data for sites inside the NTZ and outside the NTZ. On the small number of occasions where the data failed the normality or equal variance tests, Mann Whitney Rank Sum tests were run to analyse data inside and outside the NTZ.

In all cases, the difference in the mean values of the sites in the NTZ and outside the NTZ were not great enough to reject the possibility that the difference was due to random sampling variability i.e. there were no statistically significant differences between sites outside the NTZ and inside the NTZ. However, t-tests may fail to detect differences when one actually exists and we must be cautious in over-interpreting the lack of differences found since the power of the tests was poor (well below the desired power of 0.800 in all cases).

Grab sampling sites in biotopes 1 and 2 combined:

(i) Dependent Variable: **Number of taxa**
Normality Test: Passed (P = 0.778)
Equal Variance Test: Failed (P < 0.050)

As the equal variance test failed the Mann-Whitney Rank Sum Test was used:

Group	N	Missing	Median	25%	75%
In	6	0	91.000	73.000	121.000
Out	6	0	82.500	78.000	101.000

T = 41.000 n(small)= 6 n(big)= 6 P(est.)= 0.810 P(exact)= 0.818
There is not a statistically significant difference (P = 0.818)

(ii) Dependent Variable: **Total number of individuals**
Normality Test: Passed (P = 0.786)
Equal Variance Test: Passed (P = 0.382)

t-test

Group	Name	N	Missing	Mean	Std Dev	SEM
In		60	563.833	119.352	48.725	
Out		60	520.000	176.186	71.928	
Difference			43.833			

t = 0.505 with 10 degrees of freedom. (P = 0.625)
95 percent confidence interval for difference of means: -149.743 to 237.409
There is not a statistically significant difference between the input groups (P = 0.625).

(iii) Dependent Variable: d Margalef's species richness
Normality Test: Passed (P = 0.616)
Equal Variance Test: Failed (P < 0.050)

As the equal variance test failed the Mann-Whitney Rank Sum Test was used:
Mann-Whitney Rank Sum Test

Group	N	Missing	Median	25%	75%
In	6	0	14.701	11.397	18.603
Out	6	0	13.473	11.845	15.450

T = 42.000 n(small)= 6 n(big)= 6 P(est.)= 0.689 P(exact)= 0.699
There is not a statistically significant difference (P = 0.699)

(iv) Dependent Variable: **J' Pielou's Evenness**
Normality Test: Passed (P = 0.174)
Equal Variance Test: Passed (P = 0.943)

t test

Group	Name	N	Missing	Mean	Std Dev	SEM
In		60	0.787	0.0580	0.0237	
Out		60	0.778	0.0486	0.0198	
Difference			0.00905			

t = 0.293 with 10 degrees of freedom. (P = 0.776)
95 percent confidence interval for difference of means: -0.0598 to 0.0779
There is not a statistically significant difference between the input groups (P = 0.776).

(v) Dependent Variable: **ES (20)**
Normality Test: Passed (P = 0.209)
Equal Variance Test: Passed (P = 0.466)

t-test

Group	Name	N	Missing	Mean	Std Dev	SEM
In		60	13.767	1.975	0.806	
Out		60	13.377	1.332	0.544	
Difference			0.390			

t = 0.401 with 10 degrees of freedom. (P = 0.697)
95 percent confidence interval for difference of means: -1.777 to 2.557
There is not a statistically significant difference between the input groups (P = 0.697).

(vi) Dependent Variable: **H'(loge) Shannon Diversity Index**
Normality Test: Passed (P = 0.297)
Equal Variance Test: Passed (P = 0.260)

t-test

Group	Name	N	Missing	Mean	Std Dev	SEM
In		60	3.580	0.475	0.194	
Out		60	3.454	0.295	0.121	
Difference			0.126			

t = 0.553 with 10 degrees of freedom. (P = 0.592)
95 percent confidence interval for difference of means: -0.383 to 0.635
There is not a statistically significant difference between the input groups (P = 0.592).

Core sampling sites only

(i) Dependent Variable: **Number of taxa**
Normality Test: Passed (P = 0.596)
Equal Variance Test: Passed (P = 0.062)

t-test

Group	Name	N	Missing	Mean	Std Dev	SEM
In		60	46.000	31.235	12.751	
Out		50	32.000	12.806	5.727	
Difference			14.000			

t = 0.932 with 9 degrees of freedom. (P = 0.375)
95 percent confidence interval for difference of means: -19.967 to 47.967
There is not a statistically significant difference between the input groups (P = 0.375).

(ii) Dependent Variable: **Total number of individuals**
Normality Test: Passed (P = 0.051)
Equal Variance Test: Failed (P < 0.050)

As the equal variance test failed the Mann-Whitney Rank Sum Test was used:

Group	N	Missing	Median	25%	75%
In	6	0	188.500	36.000	620.000
Out	5	0	104.000	71.000	111.000

T = 27.000 n(small)= 5 n(big)= 6 P(est.)= 0.648 P(exact)= 0.662
The difference in the median values between the two groups is not great enough to exclude the possibility that the difference is due to random sampling variability; there is not a statistically significant difference (P = 0.662)

(iii) Dependent Variable: **d Margalef's species richness**
Normality Test: Passed (P = 0.721)
Equal Variance Test: Passed (P = 0.220)

t-test

Group Name	N	Missing	Mean	Std Dev	SEM
In	60		8.193	4.323	1.765
Out	50		6.851	2.325	1.040
Difference			1.342		

t = 0.620 with 9 degrees of freedom. (P = 0.551)
95 percent confidence interval for difference of means: -3.556 to 6.239
There is not a statistically significant difference between the input groups (P = 0.551).

(iv) Dependent Variable: **J' Pielou's Evenness**
Normality Test: Passed (P = 0.138)
Equal Variance Test: Passed (P = 0.347)

t-test

Group Name	N	Missing	Mean	Std Dev	SEM
In	60		0.815	0.104	0.0426
Out	50		0.875	0.0466	0.0208
Difference			-0.0601		

t = -1.186 with 9 degrees of freedom. (P = 0.266)
95 percent confidence interval for difference of means: -0.175 to 0.0545
There is not a statistically significant difference between the input groups (P = 0.266).

(v) Dependent Variable: **ES(20)**
Normality Test: Passed (P = 0.809)
Equal Variance Test: Passed (P = 0.845)

t-test

Group Name	N	Missing	Mean	Std Dev	SEM
In	60		12.019	2.672	1.091
Out	50		12.901	2.323	1.039
Difference			-0.882		

t = -0.577 with 9 degrees of freedom. (P = 0.578)
95 percent confidence interval for difference of means: -4.338 to 2.575
There is not a statistically significant difference between the input groups (P = 0.578).

(vi) Dependent Variable: **H'(loge) Shannon Diversity Index**
Normality Test: Passed (P = 0.544)
Equal Variance Test: Passed (P = 0.940)

t-test

Group Name	N	Missing	Mean	Std Dev	SEM
In	60		2.861	0.590	0.241
Out	50		2.950	0.538	0.241
Difference			-0.0888		

t = -0.258 with 9 degrees of freedom. (P = 0.802)
95 percent confidence interval for difference of means: -0.867 to 0.689
There is not a statistically significant difference between the input groups (P = 0.802).

3.4 Particle size analysis and carbon content

Sediment analysis was conducted on half of the cores and grabs collected. These were dive stations 3, 4, 6, 7, 9 and 11, grab stations GM2, 4, 6, 8, 10, 12. Samples were classified in to sediment types using the standard Folk and Ward descriptions (Folk and Ward, 1957). Samples from dive stations 4, 6, 7 and grab station GM6 were classified as coarse sand, dive station 3 sample was classified as very coarse sand. Samples from dive stations 9 and 11 and grab station GM4 were classified as medium sand. Grab stations GM8, 10 and 12 were classified as fine sand. That finer sediment would occur in the deeper sites more protected from wave action by Holy Island was to be expected. Sediment analysis data are summarised in Table 4, below. Detailed sediment analysis data are given in Appendix 5, Table A5.1, and Appendix 6, Table A6.1.

Table 4. Summary of sediment PSA data

Sample location	Sediment name	Sorting	Simple description of gravel component
Dive Stn 3	Sandy Very Fine Gravel	Well Sorted	Maerl
Dive Stn 4	Very Fine Gravelly Medium Sand	Poorly Sorted	Maerl shell and stone
Dive Stn 6	Very Fine Gravelly Very Coarse Sand	Poorly Sorted	-
Dive Stn 7	Slightly Very Fine Gravelly Coarse Sand	Moderately Well Sorted	Stone and shell
Dive Stn 9	Slightly Very Fine Gravelly Medium Sand	Moderately Well Sorted	Shell, stone, maerl
Dive Stn 11	Slightly Very Fine Gravelly Medium Sand	Moderately Well Sorted	maerl and shell
GM2	Very Coarse Gravelly Fine Sand	Poorly Sorted	Whole and broken shell
GM4	Very Fine Gravelly Medium Sand	Poorly Sorted	Barnacle encrusted stone, broken hell, maerl and *Turritella communis*
GM6	Very Coarse Gravelly Fine Sand	Very Poorly Sorted	Whole and broken shell, stone
GM8	Slightly Fine Gravelly Fine Sand	Moderately Well Sorted	Shell
GM10	Slightly Medium Gravelly Fine Sand	Moderately Sorted	Shell and stone
GM12	Slightly Medium Gravelly Fine Sand	Moderately Well Sorted	*Turritella communis,* broken shell, black stones

The percentage organic carbon, nitrate component and C/N ratio for each sample is given in Table 5, below.

Table 5. Sediment samples: percentage organic carbon, nitrate component and C/N ratios

Sample location	N mg/l	% Organic Carbon	C/N
Dive Stn 4	1690	1.30	7.7
Dive Stn 6	2400	1.40	5.8
GM2	2330	1.30	5.6
GM4	2250	1.10	4.9
GM6	2140	1.20	5.6
GM8	1920	1.00	5.2
GM10	1770	1.20	6.8
GM12	1540	0.96	6.2

3.5 Towed video and stills survey

Twenty video and stills tows were completed during this survey, numbered TR12 – TR31. The locations of these can be seen in Figure 7. These were located in the deeper parts of the NTZ and surrounding area, to provide detail on the epifauna in areas where diving time would be severely limited and thus not cost effective.

Tows TR12, 13, 14, 17, 18, 19, 20 and 21 were located in the mapped biotope complex **SS.SCS.CCSMedLumVen/SS.SCS.ICS.MoeVen** (*Mediomastus fragilis*, *Lumbrineris* spp. and venerid bivalves in circalittoral coarse sand or gravel/ *Moerella* spp. with venerid bivalves in infralittoral gravelly sand). The remaining tows were located in biotope **SS.SMX.CMX.MysThyMx** (*Mysella bidentata* and *Thyasira* spp. in circalittoral muddy mixed sediment). At stations 15, 16, 22, 23, 24, 25, 26, 27, 28, 29, 30 and 31 the seabed consisted of sand or muddy sand with numerous *Turritella communis* and burrows (Figure 22). *Ophiura albida* was common, *Ophiura ophiura* less so; dense patches of *Amphiura* species also occurred here (observed as arms only, protruding through the sediment). The burrowing anemone *Cerianthus lloydii* was also common. Of note was the recording of a single *Analosoma eddystonense* at TR25 (Figure 23) and *Nephrops norvegicus* at TR31.

Figure 22. TR30, Sand or muddy sand with Turritella communis shells, Ophiura ophiura (top left) and Ophiura albida (lower right).

Figure 23. Analosoma eddystonense recorded at tow TR25.

At tows TR12, 13, 14, 17, 18, 19, 20 and 21 the sea bed consisted of more mixed sediment with large amounts of shells and shell fragments, stones, stone gravel and sand. A few burrows and mounds were recorded, but these sites tended to be slightly shallower, with coralline crusts and red algal turf on some stones and shells (Figure 24). Serpulid worms (tubes), *Pomatoceros* sp. and *Balanus balanus* were also common on stones and shells. Mobile species included *Liocarcinus depurator*, *Ophiura albida*, *Pomatoschistus pictus*. All species recorded at each tow are listed in Appendix 3, Table A3.1.

Figure 24. TR20, mixed sediment with large amounts of shells and shell fragments, stones, stone gravel and sand.

The division of habitat types by visual appearance (sand or muddy sand with *Turritella* vs mixed sediment with shell and stones) perfectly matched the division in to biotope **SS.SMX.CMX.MysThyMx** and biotope complex **SS.SCS.CCSMedLumVen**/ **SS.SCS.ICS.MoeVen** as independently identified from grab sample infaunal analysis.

3.6 Additional dive sites S1 and S3

Both sites S1 and S3 supported very little attached epifauna apart from sparse hydroids and occasional tunicates (Figure 25). The sea bed at both sites was very level, consisting of small stones, gravel and sand (station S3 also had a few scattered boulders) giving a swept appearance. *Cerianthus lloydii* was common (but in far lower densities than at similar sites within the NTZ). The most abundant species were starfish (*Asterias rubens*, *Marthasterias glacialis*, *Crossasster papposus*, *Liudia ciliaris*, *Porania pusillus*) and decapod crustaceans (*Munida rugosa*, *Cancer pagurus*, *Liocarcinus depurator*, *Macropodia* sp.). Sessile species common within the NTZ in similar depth zones (e.g. *Myxicola sarsi*, *Chaetopterus variopedatus*, *Ophiura ophiura*) were observed as being present, but in far lower densities. At station S3 (dive 14) what appeared to be straight tracks running along the seabed were noted. Some broken erect sponges (*Raspailia* or *Stelligera* sp.) lying loose on the seabed were seen, suggesting recent mechanical disturbance of some form (Figure 26). This suggestion was corroborated by significant amounts of broken rock and shells, in some cases forming the majority of the substrate. This disturbance also appeared quite recent as some rock fragments supported *Nemertesia* and other hydroid colonies lay horizontally along the seabed (Figure 26). Occasional scallops (*Pecten maximus*) were also found at station S3. Station S3 lies within the mapped biotope complex **SS.SCS.CCSMedLumVen**/ **SS.SCS.ICS.MoeVen** and, apart from the physical damage noted, appeared broadly similar to remote video and stills taken at stations within the biotope complex. Station S1 lay within the mapped biotope **SS.SMx.CMx.CIloMx.Nem**/ **SS.SMx.CMx.OphMx**, which was mostly mapped through grabs and so no comparative stills exist but it appears broadly consistent (degraded appearance apart) with that biotope complex description. The collection of more quantitative survey data from these sites would provide useful comparisons with similar habitats inside the NTZ in future years.

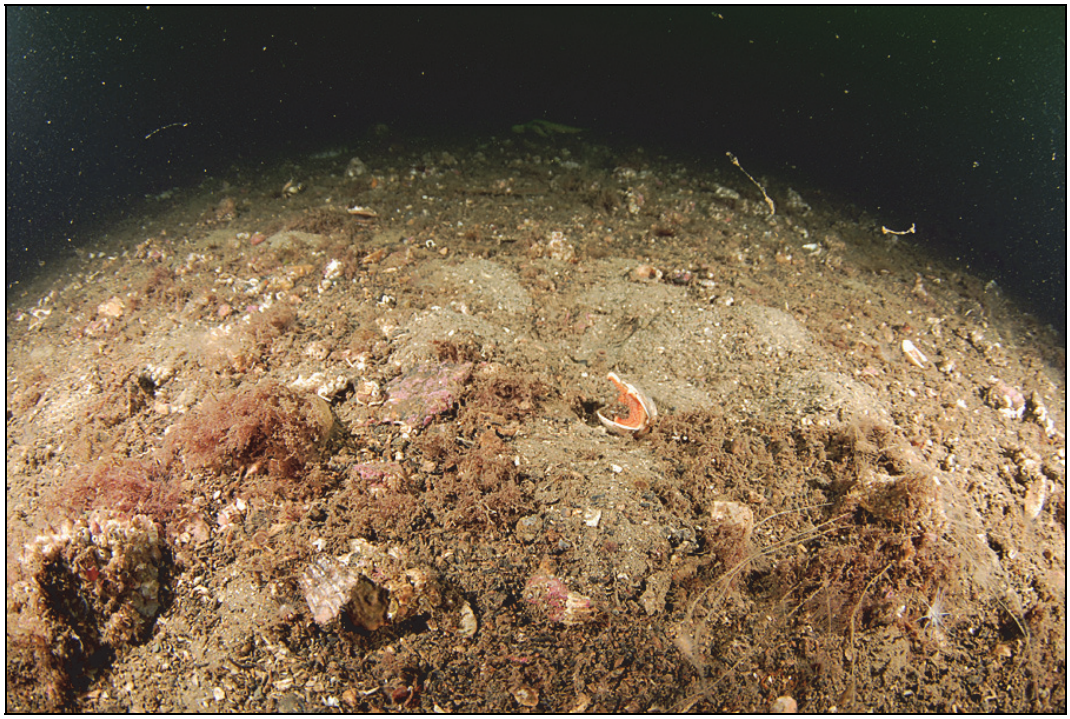

Figure 25. Dive site S3, showing a level sea bed of broken shell and stone gravel supporting little attached epifauna.

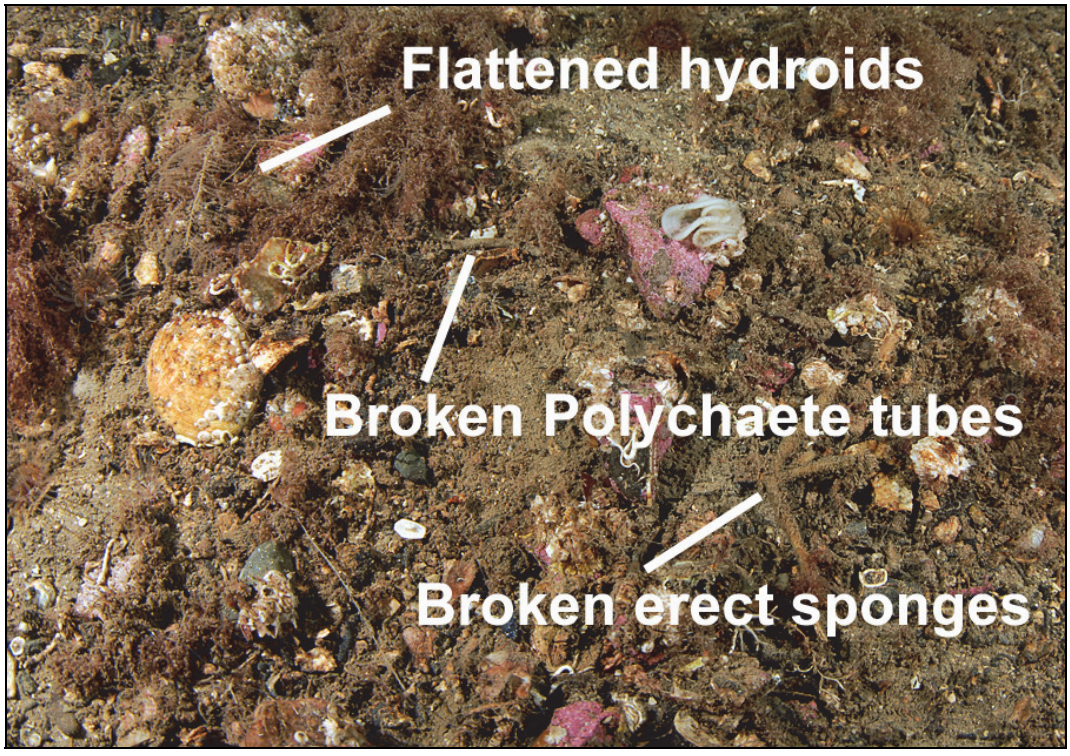

Figure 26. Dive station S3, showing detached and broken sessile epifaunal species.

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APPENDIX 1. DIVE & GRAB SURVEY DATA

Table A1.1 Dive locations, surveyors, PSA & C and Biotope codes (all positions OSGB36 datum).

Date	Loc No	Location No	Dive No	Sediment analysis codes	Divers	WP No	Lattitude	Longitude	In/Out of NTZ	PSA & C	Biotope 1 code	Biotope 2 code
26/8/10	Loc 3	*OB_ID_6*	**Dive 1**		LB & KB	189	55.54898	-5.07980	In		SS.SMPMrl.Pcal.R (IGS.Phy.R in Marine Recorder)	
26/8/10	Loc 4	*OB_ID_4*	**Dive 2**		CM & SLL	190	55.55051	-5.07857	Out		SS.SMPMrl.Pcal.R (IGS.Phy.R in Marine Recorder)	
27/8/10		OB_ID 10	**Dive 3**	D3_27_08	LB & KB	191	55.54795	-5.07963	In	PSA & C	SS.SMPMrl.Pcal.R (IGS.Phy.R in Marine Recorder)	
27/8/10		OB_ID_12	**Dive 4**	D4_27_08	CM & SLL	192	55.55072	-5.07999	Out	PSA & C	SS.SCS.ICS.MoeVen	
27/8/10		OB_ID_8	**Dive 5**		LB & KB	195	55.55117	-5.07914	Out		SS.SMp.KSwSS.Tra	
28/8/10		OB_ID_1	**Dive 6**	D6_28_08	CM & SLL	197	55.54570	-5.09181	In	PSA & C	SS.SMp.KSwSS.Tra	SS.SMPMrl.Pcal.R (IGS.Phy.R in Marine Recorder)
28/8/10		OB_ID_13	**Dive 7**	D7_28_08	LB & KB	200	55.54432	-5.09440	In	PSA & C	SS.SMP.KSwSS.LsacGraFS	
28/8/10		OB_ID_14	**Dive 8**		CM & SLL	201	55.54264	-5.09692	In		SS.SMp.KSwSS.Tra	SS.SMPMrl.Pcal.R (IGS.Phy.R in Marine Recorder)

Date	Loc No	Location No	Dive No	Sediment analysis codes	Divers	WP No	Lattitude	Longitude	In/Out of NTZ	PSA & C	Biotope 1 code	Biotope 2 code
29/8/10		*OB_ID_15*	**Dive 9**	D9_29_08	LB & KB	203	55.54050	-5.10386	out	PSA & C	SS.SMP.KSwSS.LsacGraFS	
29/8/10		*OB_ID_16*	**Dive 10**		CM & SLL	204	55.53908	-5.10637	out		SS.SMp.KSwSS.Tra	SS.SMPMrl.Pcal.R (IGS.Phy.R in Marine Recorder)
29/8/10		OB_ID_17	**Dive 11**	D11_29_08	LB & KB	205	55.53880	-5.10778	out	PSA & C	SS.SCS.ICS.MoeVen	
29/8/10		OB_ID_9	**Dive 12**		CM & SLL		55.54842	-5.08119	in		SS.SMp.KSwSS.LsacR.CbPb plus SS.SMP.Mrl.Pcal.R	
30/8/10	Start	S2	**Dive 13**		LB & KB	207	55.55589	-5.07864			SS.SMx.CMx.CIloMx.Nem	
	Mid point		**Dive 13**		LB & KB	208	55.55592	-5.07910				
	End		**Dive 13**		LB & KB	209	55.55564	-5.07914				
30/8/10	Start	S3	**Dive 14**		CM & SLL	210	55.54880	-5.07514			SS.SMx.CMx.CIloMx.Nem	
	Mid point		**Dive 14**		CM & SLL	212	55.54885	-5.07530				
	End		**Dive 14**		CM & SLL	213	55.54875	-5.07527				

Table A1.2. Grab locations, target (towed video & stills), waypoint, sampling position, sample description and presence of maerl (all positions OSGB36 datum).

Stn No	Target	Waypoint No	Date	Sample	lat	long	Description	% maerl
GM -1	TR12	276	02/09/2010	Fauna	55.54811	-5.07533	Medium sand and shell gravel with pebbles	0
GM-1	TR12	278	02/09/2010	PSA & Carbon	55.54817	-5.07497	Medium sand and shell gravel with pebbles	0
GM-2	TR14	279	02/09/2010	Fauna	55.5448	-5.07485	90% fine muddy sand, 10% shell gravel	0
GM-2	TR14	280	02/09/2010	PSA & Carbon	55.5449	-5.07502	90% fine muddy sand, 10% shell gravel	0
GM-3	TR16	281	02/09/2010	Fauna	55.5411	-5.07421	Fine silty sand with shell gravel, occasional shell fragments, Amphiura and Turritella	0
GM-3	TR16	282	02/09/2010	PSA & Carbon	55.54121	-5.07415	Fine silty sand with shell gravel, occasional shell fragments, Amphiura and Turritella	0
GM-4	TR17	285	02/09/2010	Fauna	55.54316	-5.08314	Fine to medium silty sand with broken shell and pebbles.	0
GM-4	TR17	286	02/09/2010	PSA & Carbon	55.54317	-5.08306	Fine to medium silty sand with broken shell and pebbles.	0
GM-5	TR19	287	02/09/2010	Fauna	55.53984	-5.08253	Silty medium shelly sand with pebbles	0
GM-5	TR19	289	02/09/2010	PSA & Carbon	55.53979	-5.08253	Silty medium shelly sand with pebbles	0
GM-6	TR20	290	02/09/2010	Fauna	55.54125	-5.087	50% shell gravel, 50% silty, shelly medium sand with pebbles.	0
GM-6	TR20	291	02/09/2010	PSA & Carbon	55.54124	-5.08686	50% shell gravel, 50% silty, shelly medium sand with pebbles.	0
GM-7	TR22	292	02/09/2010	Fauna	55.54262	-5.09262	90% silty fine sand with shell fragments and Turritella.	0

Stn No	Target	Waypoint No	Date	Sample	lat	long	Description	% maerl
GM-7	TR22	293	02/09/2010	PSA & Carbon	55.54248	-5.0926	90% silty fine sand with shell fragments and *Turritella*.	0
GM-8	TR24	294	02/09/2010	Fauna	55.53897	-5.09229	Slightly sandy mud with about 2% shell gravel. *Amphiura, Turritella*, Echinocardium	0
GM-8	TR24	295	02/09/2010	PSA & Carbon	55.53893	-5.09249	Slightly sandy mud with about 2% shell gravel. *Amphiura, Turritella*, Echinocardium	0
GM-9	TR26	296	02/09/2010	Fauna	55.53858	-5.09952	Muddy fine sand with 2% shell gravel. *Amphiura* & *Turritella.*	0
GM-9	TR26	297	02/09/2010	PSA & Carbon	55.53867	-5.09947	Muddy fine sand with 2% shell gravel. *Amphiura* & *Turritella*.	0
GM-10	TR27	298	02/09/2010	Fauna	55.53613	-5.10755	Muddy fine sand with 4% shell. *Turritella*, polychaete tubes	0
GM-10	TR27	301	02/09/2010	PSA & Carbon	55.53623	-5.10768	Muddy fine sand with 4% shell. *Turritella*, polychaete tubes	0
GM-11	TR29	302	02/09/2010	Fauna	55.53333	-5.10464	Slightly sandy silt with shell gravel with *Turritella* and *Amphiura*	0
GM-11	TR29	303	02/09/2010	PSA & Carbon	55.53337	-5.10461	Slightly sandy silt with shell gravel with *Turritella* and *Amphiura*	0
GM-12	TR31	304	02/09/2010	Fauna	55.52958	-5.09654	Sandy silt with sabellid tubes, 2% shell gravel, *Amphiura, Turritella*	0
GM-12	TR31	305	02/09/2010	PSA & Carbon	55.52967	-5.09657	Sandy silt with sabellid tubes, 2% shell gravel, *Amphiura, Turritella*	0

Table A1.3. Dive stations 1-6, all species.

DIVE STATION	Stn 1	Stn 1	Stn 1	Stn 2	Stn 2	Stn 2	Stn 3	Stn 3	Stn 3	Stn 4	Stn 4	Stn 4	Stn 5	Stn 5	Stn 5	Stn 6	Stn 6	Stn 6
TRANSECT	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**
Porifera																		
Amphilectis fucorum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	-	-
Scypha ciliata	-	R	R	-	R	-	-	-	R	-	-	-	-	-	-	-	-	-
Suberites pagurorum (on *P. cuanensis*)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Suberites sp.	-	-	-	-	R	-	R	R	-	-	-	-	-	-	-	O	-	-
Cnidaria																		
Virgularia mirabilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Adamsia carciniopados	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cerianthus lloydii	F	C	C	S	S	S	F	F	F	O	O	O	C	C	C	F	F	F
Metridium senile	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Peachia cylindrica	R	R	-	-	-	-	-	-	-	O	O	-	-	-	-	-	-	-
Sagartiogeton sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Abietenaria abietina	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Halecium halicinum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Halopteris katherina	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hydractinia echinata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kirchenpaueria sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nemertesia anntenina	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nemertesia ramosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Obelia sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Schizotricha frutescens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sertularella polyzonias	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nemertea																		
Tubulanus sp.	-	-	-	-	-	-	-	R	-	-	O	-	-	-	-	-	-	-
Annelida																		
?Megalomma vesiculosum	R	-	-	-	-	-	-	-	-	-	-	-	R	-	-	-	-	-
Aphrodita aculeata	-	-	-	R	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arenicola sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

DIVE STATION	Stn 1	Stn 1	Stn 1	Stn 2	Stn 2	Stn 2	Stn 3	Stn 3	Stn 3	Stn 4	Stn 4	Stn 4	Stn 5	Stn 5	Stn 5	Stn 6	Stn 6	Stn 6
TRANSECT	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**
Chaetopterus variopodetus	O	O	O	-	R	R	O	R	O	-	R	-	O	R	O	C	C	C
Lanice conchilega	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Myxicola infundibulum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Myxicola sarsi	-	-	-	O	O	F	-	-	-	-	-	-	R	R	-	-	-	-
Pomotoceros sp.	O	F	O	-	-	-	O	R	R	-	-	-	-	-	-	O	-	-
Protula tubularia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	O	O
Sabellidae indet.	O	O	-	-	-	-	O	O	O	-	-	-	R	R	-	-	-	-
Spirorbidae indet.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	O	O
Terebellidae indet.	-	-	-	-	-	-	-	-	-	F	-	-	-	-	-	F	F	-
Crustacea																		
Balanus crenatus	-	-	-	-	-	-	-	-	-	-	-	-	R	-	-	-	-	-
Barnacles indet.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Crangon crangon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Galathea sp.	R	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	-	O
Hippolyte varians?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mantis-type burrows	-	-	-	-	-	-	-	-	-	-	-	-	R	-	O	-	-	-
Munida rugosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mysidacea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Palaemonidae indet.	-	-	-	-	-	-	-	O	-	-	-	-	-	-	-	O	-	-
Anapagurus hyndmanni	-	-	-	-	-	-	-	-	-	O	-	-	-	-	-	-	-	-
Atelecyclus rotundatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cancer pagurus	O	-	-	-	-	-	-	R	O	F	F	C	-	-	-	-	-	-
Carcinus maenas	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hyas sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Inachus dorsettensis	-	-	-	-	-	-	-	-	-	-	-	-	R	R	R	-	-	-
Inachus phalangium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Liocarcinus corrugatus	-	-	R	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Liocarcinus depurator	-	-	O	R	-	-	-	R	O	-	-	-	R	O	O	F	O	O
Liocarcinus marmoreus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Macropodia sp.	-	-	R	-	-	-	-	-	R	-	O	-	-	-	-	O	O	O
Necora puber	O	O	O	F	O	F	-	O	O	-	-	-	R	O	O	-	O	-
Paguridae indet.	R	-	-	F	F	F	O	-	R	O	O	O	O	-	O	F	F	-

DIVE STATION	Stn 1	Stn 1	Stn 1	Stn 2	Stn 2	Stn 2	Stn 3	Stn 3	Stn 3	Stn 4	Stn 4	Stn 4	Stn 5	Stn 5	Stn 5	Stn 6	Stn 6	Stn 6
TRANSECT	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**
Pagurus bernhardus	-	-	-	R	-	R	-	R	R	O	O	O	R	-	-	O	O	O
Pagurus cuanensis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pagurus prideauxi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mollusca																		
Chiton	-	-	-	F	F	F	-	-	-	-	-	-	-	-	-	O	-	-
?Lacuna vincta	-	-	-	-	-	-	-	-	R	-	-	-	-	-	-	-	-	-
Adalaria proxima	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R	-	-	-
Colus gracilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Doto sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Eubranchus farrani	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	-	-
Favorinus blianus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gibbula cineraria	-	-	-	-	-	-	-	-	R	-	O	-	-	-	-	-	-	-
Gibbula magus	-	-	R	-	-	-	R	R	R	R	-	-	-	-	-	-	-	-
Limacia clavigera	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Onchidoris bilamellata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rissoidae indet.	A	A	A	-	-	-	O	-	O	-	-	-	-	-	F	-	-	-
Tectura sp.	-	-	-	-	-	-	R	-	-	-	-	-	-	-	O	-	-	-
Dosinia exoleta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ensis sp.	-	-	-	O	-	O	-	-	-	-	-	-	-	-	-	-	-	-
Glycymeris glycymeris	-	-	-	O	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mytillidae juv. indet.	S	S	S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pecten maximus	O	O	-	O	F	O	-	-	-	-	-	-	-	-	R	-	-	-
*Pecten maximus (*juv. spat*)*	R	R	R	-	-	-	O	O	O	-	-	-	-	O	O	-	-	-
?Ensis (siphons)	O	O	O	-	-	-	O	O	O	-	-	-	-	R	R	-	-	-
Bivalve siphons PELECYPODA	O	O	O	-	-	-	O	-	-	-	-	-	-	-	-	-	-	-
Bryozoa																		
Bugula turbinata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Crissiidae indet.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electra pilosa	R	R	O	-	-	-	-	-	O	-	-	-	R	-	-	-	-	-

DIVE STATION	Stn 1	Stn 1	Stn 1	Stn 2	Stn 2	Stn 2	Stn 3	Stn 3	Stn 3	Stn 4	Stn 4	Stn 4	Stn 5	Stn 5	Stn 5	Stn 6	Stn 6	Stn 6
TRANSECT	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**
Membranipora membranacea	R	-	-	-	-	-	F	O	F	-	-	-	-	-	-	-	-	-
Omalosecosa ramulosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Scrupocellaria sp.	-	-	-	-	-	-	O	-	-	-	-	-	-	-	-	-	-	-
Echinodermata																		
Antedon bifida	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asterias rubens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asterias rubens juv.	F	F	F	C	C	C	O	O	O	C	C	C	F	R	R	-	-	-
Asteropecten irregularis	-	F	-	-	-	-	-	R	-	O	-	O	-	-	-	-	-	-
Crossaster papposus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Echinus esculentus	-	-	-	-	-	-	-	-	-	O	O	R	-	-	-	-	-	-
Henricia sp.	R	R	R	O	O	R	R	-	R	-	-	-	-	-	-	-	F	-
Leptosynapta inhaerens	-	-	-	-	-	-	-	-	-	-	-	R	-	-	-	-	-	-
Luidia ciliaris	R	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Luidia sarsi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Marthasterias glacialis	C	F	O	C	C	F	R	F	R	-	-	-	O	O	R	F	C	C
Ophiothris fragilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ophiura albida	-	-	R	-	-	-	-	R	-	-	-	-	-	-	-	-	-	-
Porania pulvillus	-	-	-	O	-	-	-	-	-	-	-	-	O	-	R	-	-	-
Psammechinus miliaris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Solaster endica	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tunicata																		
?Diplosoma listeranium (on tideswept algae)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
?Diplosoma spongiforme	R	R	O	-	-	-	R	R	R	-	-	-	-	-	-	-	-	-
?Polycarpa pomaria	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
?Polycarpa sp.	-	-	-	O	-	-	R	-	R	-	-	-	-	-	-	O	-	-
Ascidia mentula	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ascidia virginea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ascidiella aspersa	R	R	O	-	-	-	F	R	R	O	O	O	R	-	-	-	-	-
Ciona intestinalis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

DIVE STATION	Stn 1	Stn 1	Stn 1	Stn 2	Stn 2	Stn 2	Stn 3	Stn 3	Stn 3	Stn 4	Stn 4	Stn 4	Stn 5	Stn 5	Stn 5	Stn 6	Stn 6	Stn 6
TRANSECT	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**
Clavellina lepadiformis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Corella parallelogramma	-	-	-	-	O	-	R	R	-	-	-	-	-	-	-	-	-	-
Molgula?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Polycarpa cf .scuba	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
.																		
Fish																		
15-spine stickle back	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Callionimous lyra	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Callionimous sp. *(reticulatus?)*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R	-	-
Callionymus sp. juv.	-	-	-	-	-	-	O	R	-	-	-	-	-	-	-	-	-	-
Diplocogaster bimaculata	-	R	-	-	-	-	R	R	-	-	-	-	-	-	-	-	-	-
Gobiusculus flavescens	-	-	-	R	-	-	-	R	R	O	O	-	-	-	-	O	O	O
Labrus bergylta juv.	-	-	-	-	-	-	R	R	R	-	-	-	-	-	R	-	-	-
Myoxocephalus scorpius	R	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pholis gunnellus	R	R	-	O	O	O	O	R	R	-	-	-	R	O	O	O	-	O
Pleuronectes platessa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pleuronectidae juv.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pomatoschistus minutus/lozanoi	O	-	-	-	-	-	O	-	O	-	-	-	-	-	-	-	-	-
Pomatoschistus pictus	F	C	O	F	F	F	F	O	F	F	O	-	R	R	O	F	O	F
Scyliorhinus canicula	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Syngnathus acus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Syngnathus acus juv. or adult Nilsson?*s* Pipefish - *Syngnathus rostellatus*	-	-	-	-	-	-	-	R	-	-	-	-	-	-	-	-	-	-
Rhodophycota																		
Rhodymenia sp.	F	O	O	-	-	-	-	F	-	-	-	-	-	-	-	-	-	-
Aglaothamnion ?byssoides (dom fil red)	A	A	A	-	-	-	F	F	C	-	-	-	S	S	S	-	-	-
Aglaothamnion sp.	-	-	-	S	S	S	-	-	-	C	F	O	-	-	-	-	O	-
Apoglossum ruscifolium	-	-	O	-	-	-	R	-	-	-	-	-	-	-	-	-	-	-
Bonnemassonia asparagoides	R	R	-	-	-	-	-	O	-	-	-	-	-	R	R	-	-	-

DIVE STATION	Stn 1	Stn 1	Stn 1	Stn 2	Stn 2	Stn 2	Stn 3	Stn 3	Stn 3	Stn 4	Stn 4	Stn 4	Stn 5	Stn 5	Stn 5	Stn 6	Stn 6	Stn 6
TRANSECT	Tr1	Tr2	Tr3	Tr1	Tr2	Tr3	Tr1	Tr2	Tr3	Tr1	Tr2	Tr3	Tr1	Tr2	Tr3	Tr1	Tr2	Tr3
Brongniartella byssoides	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ceramium sp.	-	O	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chondria dasyphylla	-	-	-	-	-	-	R	R	O	-	-	-	-	-	-	-	-	-
Chondrus crispus	O	-	-	-	-	-	O	O	-	-	O	-	-	-	-	-	-	-
Chylocladia verticillata	O	O	O	-	-	-	O	-	R	-	-	-	-	-	-	-	-	-
Corallina sp. long/thin	-	-	-	-	-	-	-	-	R	-	-	-	-	-	-	-	-	-
Cyanobacteria? Small dark red balls	R	R	R	-	-	-	-	O	-	-	-	-	-	R	R	-	-	-
Delesseria sanguinea	R	R	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dilsea carnosa	-	-	O	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dudresnaya verticillata	R	R	R	-	-	-	R	-	R	-	-	-	-	-	-	-	-	-
Encrusting coralline algae	-	-	-	-	R	-	-	-	-	-	-	-	-	-	R	O	O	O
Filamentous red/brown algae indet. (aggregate) forming balls around stones etc.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	S	S	S
Gracilaria/Gracialriopsis	O	-	-	-	-	-	O	R	-	-	-	-	O	O	O	-	-	-
Halurus flosculosus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heterosiphonia plumosa	O	-	-	-	-	-	-	F	-	-	-	-	-	O	F	-	-	-
Hypoglossum hypoglossoides	-	-	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Live Maerl	R	R	R	-	R	R	F	F	F	-	-	-	-	-	-	O	-	-
Monosporus pedicellatus	-	-	R	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Odonthalis dentata	R	-	R	-	-	-	O	-	F	-	-	-	O	-	-	-	-	-
Palmaria palmata	F	O	R	-	-	-	O	-	O	-	-	-	-	-	-	-	-	-
Phycodrus rubens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pink encrusting algae	R	R	R	-	-	-	-	-	-	-	-	-	-	R	-	-	-	-
Plocamium cartilagineum	-	-	-	-	-	-	-	R	-	-	-	-	-	-	-	-	-	-
Polyides rotundus	-	O	-	-	-	-	-	-	-	O	F	O	R	-	-	O	O	O
Polysiphonia elongata	-	-	-	-	-	-	R	-	O	-	-	-	O	R	O	-	-	-
Polysiphonia sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pterocladia capillacea	F	O	O	-	-	-	O	O	R	-	-	-	-	-	R	-	-	-
Pterothamnion plumula	-	-	-	-	-	-	-	F	-	-	-	-	F	-	O	-	-	-
Red encrusting algae on pebbles	-	-	R	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

DIVE STATION	Stn 1	Stn 1	Stn 1	Stn 2	Stn 2	Stn 2	Stn 3	Stn 3	Stn 3	Stn 4	Stn 4	Stn 4	Stn 5	Stn 5	Stn 5	Stn 6	Stn 6	Stn 6
TRANSECT	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**
Scinaia cf turgida	F	-	O	-	-	-	R	O	O	-	-	-	-	-	O	-	-	-
Sphondylothamnion mult	-	O	-	-	-	-	-	-	-	-	-	-	O	O	O	-	-	-
Traliella	O	O	O	-	-	-	C	-	-	-	-	-	R	-	-	-	-	-
Phaeophycota																		
Asperococcus sp.	R	-	R	-	-	-	O	R	-	-	-	-	-	-	R	-	-	-
cf Stilophora sp. slimy	-	-	-	-	-	-	O	R	O	-	-	-	-	-	O	-	-	-
Chorda filum	C	-	F	-	-	-	O	-	R	O	F	F	-	-	R	-	-	-
Desmarestia aculeata	F	O	O	-	-	-	R	R	F	-	-	-	-	R	O	-	-	-
Desmarestia ligulata	-	-	-	-	-	-	R	-	O	-	-	-	-	-	-	-	-	-
Dictyota dichotoma	F	F	F	-	-	-	O	O	R	-	-	-	-	-	R	-	-	-
Ectocarpaceae	O	O	O	-	-	-	-	-	R	-	-	-	F	-	F	-	-	-
Halydris siliquosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Laminaria saccharina	F	F	S	O	-	-	C	A	A	F	F	F	O	O	O	-	O	O
Laminaria saccharina (drift)	-	-	-	-	R	-	-	-	-	-	-	-	-	-	-	-	-	-
Sachorhiza polyschides	-	R	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Skiny *Asperococcus fistulosus*?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sphaerococcus	F	O	O	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stringy brown ?*Striaria*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorophycota																		
Ulva	O	O	O	R	O	-	R	R	R	O	O	O	R	-	-	-	-	O
Algal film on sediment - golden	-	-	-	-	-	-	-	-	-	-	-	-	R	R	-	-	-	-

Table A1.3 (cont.) Dive stations 7-12, S1 and S3, all species.

DIVE STATION	Stn 7	Stn 7	Stn 7	Stn 8	Stn 8	Stn 8	Stn 9	Stn 9	Stn 9	Stn 10	Stn 10	Stn 10	Stn 11	Stn 11	Stn 11	Stn 12	Stn 12	Stn 12	S1	S3
TRANSECT	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**		
Porifera																				
Amphilectis fucorum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R	-	-	-
Scypha ciliata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Suberites pagurorum (on *P. cuanensis*)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R	-	-	-
Suberites sp.	-	-	-	-	-	-	-	-	-	R	-	-	-	-	-	-	-	-	-	-
Cnidaria																				
Virgularia mirabilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R	-
Adamsia carciniopados	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R
Cerianthus lloydii	-	-	-	-	O	-	O	O	R	F	O	O	O	O	O	F	F	-	F	C
Metridium senile	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R
Peachia cylindrica	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sagartiogeton sp.	-	-	-	-	-	-	-	-	R	-	-	-	-	-	-	-	-	-	R	-
Abietenaria abietina	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R
Halecium halicinum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R
Halopteris katherina	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R	R
Hydractinia echinata	-	-	-	-	-	-	-	-	-	-	-	O	R	R	R	-	-	-	-	-
Kirchenpaueria sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	F
Nemertesia anntenina	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	F
Nemertesia ramosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	F
Obelia sp.	F	F	F	-	-	-	R	O	R	O	O	-	R	R	R	O	O	O	-	R
Schizotricha frutescens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R
Sertularella polyzonias	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O

DIVE STATION	Stn 7	Stn 7	Stn 7	Stn 8	Stn 8	Stn 8	Stn 9	Stn 9	Stn 9	Stn 10	Stn 10	Stn 10	Stn 11	Stn 11	Stn 11	Stn 12	Stn 12	Stn 12	S1	S3
TRANSECT	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**		
Nemertea																				
Tubulanus sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Annelida																				
?*Megalomma vesiculosum*	-	-	-	-	-	-	-	-	-	-	-	-	O	-	R	-	-	-	-	-
Aphrodita aculeata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arenicola sp.	R	-	-	-	-	-	O	R	R	-	-	-	-	-	-	-	-	-	-	-
Chaetopterus variopodetus	F	C	C	F	F	O	O	O	O	F	O	O	R	-	R	O	R	O	-	O
Lanice conchilega	-	-	-	-	-	-	-	-	-	-	-	-	-	R	R	-	-	-	-	R
Myxicola infundibulum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Myxicola sarsi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	F	R
Pomotoceros sp.	R	R	-	O	O	O	-	-	-	-	-	-	-	-	-	O	O	O	-	F
Protula tubularia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sabellidae indet.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R
Spirorbidae indet.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	O	O	-	-
Terebellidae indet.	-	-	-	-	R	F	-	-	-	-	-	-	-	-	R	-	-	-	-	-
Crustacea																				
Balanus crenatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A
Barnacles indet.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	C	-
Crangon crangon	-	-	-	-	-	-	O	O	-	-	-	-	-	-	-	-	-	-	-	-
Galathea sp.	-	-	-	-	-	-	-	R	-	O	-	-	-	-	-	-	-	-	O	R
Hippolyte varians?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R
Mantis-type burrows	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Munida rugosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	C	C
Mysidacea	-	-	R	-	-	-	-	-	R	-	-	-	-	-	-	-	-	-	-	-
Palaemonidae indet	R	R	O	F	-	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anapagurus hyndmanni	R	-	-	-	-	-	-	-	-	F	-	-	-	-	-	-	-	-	-	-
Atelecyclus rotundatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	R

DIVE STATION	Stn 7	Stn 7	Stn 7	Stn 8	Stn 8	Stn 8	Stn 9	Stn 9	Stn 9	Stn 10	Stn 10	Stn 10	Stn 11	Stn 11	Stn 11	Stn 12	Stn 12	Stn 12	S1	S3
TRANSECT	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**		
Cancer pagurus	-	-	-	O	O	O	-	-	-	-	-	-	R	-	-	-	-	-	O	-
Carcinus maenas	-	R	R	F	F	F	O	R	R	O	F	-	R	R	R	-	-	-	-	-
Hyas sp.	-	-	-	-	-	-	-	-	-	O	-	-	-	-	-	-	-	-	-	R
Inachus dorsettensis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R	-	-	-	-	R
Inachus phalangium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R
Liocarcinus corrugatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Liocarcinus depurator	-	O	R	F	F	F	O	O	-	C	O	O	R	R	O	F	-	-	F	R
Liocarcinus marmoreus	R	R	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Macropodia sp.	O	O	O	F	C	F	R	R	R	F	F	O	R	R	R	-	-	-	F	R
Necora puber	-	R	-	-	F	-	-	-	-	C	F	O	-	R	-	F	-	F	O	R
Paguridae indet.	R	-	O	F	F	F	-	F	-	F	F	F	O	R	O	-	-	-	-	-
Pagurus bernhardus	R	-	R	O	O	O	-	-	-	-	O	O	R	R	R	F	-	-	O	R
Pagurus cuanensis	R	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R	-	-	-
Pagurus prideauxi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R
Mollusca																				
Chiton	-	-	-	-	-	-	-	-	-	O	-	-	-	-	-	-	R	-	-	-
?Lacuna vincta	-	F	C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Adalaria proxima	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Colus gracilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R
Doto sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R
Eubranchus farrani	-	R	-	-	-	-	R	R	R	-	O	-	-	-	-	-	-	-	-	-
Favorinus blianus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R
Gibbula cineraria	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gibbula magus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R	R	-	-	-
Limacia clavigera	-	-	R	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

DIVE STATION	Stn 7	Stn 7	Stn 7	Stn 8	Stn 8	Stn 8	Stn 9	Stn 9	Stn 9	Stn 10	Stn 10	Stn 10	Stn 11	Stn 11	Stn 11	Stn 12	Stn 12	Stn 12	S1	S3
TRANSECT	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**		
Onchidoris bilamellata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	F	F
Rissoidae indet.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	-	-	-	-	-
Tectura sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dosinia exoleta	-	-	-	-	-	-	-	-	-	-	R	-	-	-	-	-	-	-	-	-
Ensis sp.	-	-	-	F	O	-	-	-	-	-	-	F	-	-	-	O	-	-	-	-
Glycymeris glycymeris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mytillidae juv. Indet.	A	C	A	-	-	-	-	R	-	-	-	-	-	-	-	-	-	-	-	-
Pecten maximus	-	-	-	F	-	-	-	-	-	F	-	F	-	-	-	-	-	-	F	O
Pecten maximus (juv. spat)	R	R	-	-	-	-	-	-	-	-	R	R	-	-	-	-	-	-	-	-
?Ensis (siphons)	-	-	-	-	-	-	F	O	-	-	-	-	O	O	F	-	-	-	-	-
Bivalve siphons PELECYPODA	-	-	-	-	-	-	O	-	-	-	-	-	-	-	O	-	-	-	-	-
Bryozoa																				
Bugula turbinata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R
Crissiidae indet	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R
Electra pilosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	O	-	-
Membranipora membranacea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Omalosecosa ramulosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O
Scrupocellaria sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Echinodermata																				
Antedon bifida	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O
Asterias rubens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	R
Asterias rubens juv	-	-	R	-	-	-	-	-	-	-	F	F	-	-	-	-	-	O	-	-
Asteropecten irregularis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	R
Crossaster papposus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	F	R

DIVE STATION	Stn 7	Stn 7	Stn 7	Stn 8	Stn 8	Stn 8	Stn 9	Stn 9	Stn 9	Stn 10	Stn 10	Stn 10	Stn 11	Stn 11	Stn 11	Stn 12	Stn 12	Stn 12	S1	S3
TRANSECT	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**		
Echinus esculentus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	F	F	-	-
Henricia sp.	-	-	-	O	-	-	-	-	-	-	-	-	-	-	-	O	O	F	-	-
Leptosynapta inhaerens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Luidia ciliaris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O
Luidia sarsi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	-
Marthasterias glacialis	-	-	-	F	C	F	-	-	-	-	F	O	R	-	O	O	F	O	F	F
Ophiothris fragilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R	-
Ophiura albida	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	R
Porania pulvillus	-	-	-	-	-	-	-	-	-	R	-	-	-	-	-	-	-	-	O	F
Psammechinus miliaris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R
Solaster endica	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tunicata																				
?*Diplosoma listeranium* (on tideswept algae)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	F	O	-	-
?*Diplosoma spongiforme*	R	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
?*Polycarpa pomaria*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R
?*Polycarpa* sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ascidia mentula	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	-
Ascidia virginea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R	R
Ascidiella aspersa	O	-	R	-	-	-	-	-	-	-	-	-	-	-	-	O	-	-	-	-
Ciona intestinalis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R
Clavellina lepadiformis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	-	-	O
Corella parallelogramma	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	O	O	O
Molgula?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	-	-
Polycarpa cf scuba	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R
Fish																				

DIVE STATION	Stn 7	Stn 7	Stn 7	Stn 8	Stn 8	Stn 8	Stn 9	Stn 9	Stn 9	Stn 10	Stn 10	Stn 10	Stn 11	Stn 11	Stn 11	Stn 12	Stn 12	Stn 12	S1	S3
TRANSECT	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**		
15-spine stickle back	-	R	R	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Callionimous lyra	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R	-
Callionimous sp .*(reticulatus?)*	-	-	-	-	-	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Callionymus sp. juv.	-	-	-	-	-	-	-	-	-	-	-	-	-	R	-	-	-	-	-	-
Diplocogaster bimaculata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R	-	-	-	-	-
Gobiusculus flavescens	C	C	C	O	-	-	-	-	-	-	O	O	-	-	-	F	F	F	-	-
Labrus bergylta juv.	-	-	R	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Myoxocephalus scorpius	-	-	R	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pholis gunnellus	R	R	-	-	O	-	-	-	-	O	-	-	R	-	R	-	-	-	-	R
Pleuronectes platessa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R
Pleuronectidae juv.	-	R	O	-	-	-	O	R	-	-	-	-	R	R	O	-	-	-	-	-
Pomatoschistus minutus/lozanoi	F	F	O	-	-	-	F	F	F	-	-	-	F	F	F	-	-	-	-	-
Pomatoschistus pictus	C	C	F	F	F	O	F	O	F	O	-	F	O	F	F	O	F	F	-	R
Scyliorhinus canicula	-	-	R	-	-	R	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Syngnathus acus	-	-	-	O	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Syngnathus acus juv or adult Nilsson?s Pipefish - *Syngnathus rostellatus*	-	R	-	-	-	-	R	R	-	-	-	-	-	R	-	-	-	-	-	-
Rhodophycota																				
Rhodymenia sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aglaothamnion ?byssoides (dom fil red)	O	O	-	-	-	-	-	-	-	-	-	-	-	O	-	-	-	-	-	O
Aglaothamnion sp.	-	-	-	-	F	-	-	-	-	F	-	-	-	-	-	-	-	-	-	-
Apoglossum ruscifolium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

DIVE STATION	Stn 7	Stn 7	Stn 7	Stn 8	Stn 8	Stn 8	Stn 9	Stn 9	Stn 9	Stn 10	Stn 10	Stn 10	Stn 11	Stn 11	Stn 11	Stn 12	Stn 12	Stn 12	S1	S3
TRANSECT	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**		
Bonnemassonia asparagoides	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Brongniartella byssoides	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ceramium sp.	-	-	-	-	-	-	-	-	-	-	-	-	O	-	-	-	F	-	-	-
Chondria dasyphylla	O	R	R	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chondrus crispus	-	-	R	-	-	-	-	-	-	-	-	-	-	-	-	F	F	F	-	-
Chylocladia verticillata	O	O	O	-	-	-	O	R	R	-	-	-	R	R	-	O	-	O	-	-
Corallina sp. long/thin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	-	-	-	-
Cyanobacteria? Small dark red balls	O	-	R	-	-	-	-	-	-	-	-	-	R	-	-	-	-	-	-	-
Delesseria sanguinea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R
Dilsea carnosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R	R	-	-	-
Dudresnaya verticillata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Encrusting coralline algae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	O	O	-	O
Filamentous red/brown algae indet. (aggregate) forming balls around stones etc.	-	-	-	S	S	S	-	-	-	S	S	S	-	-	-	-	-	-	-	-
Gracilaria/Gracialri opsis	-	R	-	-	-	-	-	O	R	-	-	-	O	O	O	-	-	-	-	-
Halurus flosculosus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R
Heterosiphonia plumosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hypoglossum hypoglossoides	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Live Maerl	-	-	-	-	R	-	-	-	-	-	-	-	-	-	-	-	O	-	-	-
Monosporus pedicellatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Odonthalis dentata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Palmaria palmata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

DIVE STATION	Stn 7	Stn 7	Stn 7	Stn 8	Stn 8	Stn 8	Stn 9	Stn 9	Stn 9	Stn 10	Stn 10	Stn 10	Stn 11	Stn 11	Stn 11	Stn 12	Stn 12	Stn 12	S1	S3
TRANSECT	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**		
Phycodrus rubens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R
Pink encrusting algae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Plocamium cartilagineum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Polyides rotundus	-	O	O	-	-	-	O	-	-	-	-	-	-	-	-	-	-	-	-	-
Polysiphonia elongata	R	R	R	-	-	-	R	O	O	-	-	-	-	-	-	-	-	-	-	-
Polysiphonia sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	F	-	-	-
Pterocladia capillacea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pterothamnion plumula	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R
Red encrusting algae on pebbles	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Scinaia cf turgida	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sphondylothamnion multifidum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Traliella	C	C	C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phaeophycota																				
Asperococcus sp.	-	-	R	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cf *Stilophora* sp. slimy	F	F	F	-	-	-	-	O	R	-	-	-	R	-	R	-	-	-	-	-
Chorda filum	A	C	C	O	-	-	R	R	R	-	-	-	R	O	R	O	F	O	-	-
Desmarestia aculeata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Desmarestia ligulata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dictyota dichotoma	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	F	F	-	-	-
Ectocarpaceae	C	C	A	-	-	-	F	R	R	-	-	-	F	R	R	-	-	-	-	-
Halydris siliquosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	F	F	F	-	-
Laminaria saccharina	O	O	O	-	O	-	R	R	R	F	-	-	O	-	F	O	-	F	-	-
Laminaria saccharina (drift)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	F	F	F	-	-

DIVE STATION	Stn 7	Stn 7	Stn 7	Stn 8	Stn 8	Stn 8	Stn 9	Stn 9	Stn 9	Stn 10	Stn 10	Stn 10	Stn 11	Stn 11	Stn 11	Stn 12	Stn 12	Stn 12	S1	S3
TRANSECT	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**	**Tr1**	**Tr2**	**Tr3**		
Sachorhiza polyschides	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Skiny *Asperococcus fistulosus?*	O	-	R	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sphaerococcus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stringy brown ?Striaria	F	-	O	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorophycota																				
Ulva	-	-	-	-	-	-	-	-	-	-	-	-	-	R	R	-	-	-	-	-
Algal film on sediment - golden	-	-	-	-	-	-	O	O	O	-	-	-	O	O	O	-	-	-	-	-

APPENDIX 2. INFAUNA ANALYSIS DATA

Table A2.1. Dive stations infauna data, all species.

MCS Code		Latin Name	Common Name	Conservation status	Stn1	Stn 2	Stn 3	Stn 4	Stn 5	Stn 6	Stn 7	Stn 8	Stn 9	Stn 10	Stn 11	Stn 12	Total
C	480	*Cliona celata*								P							P
D	491	Campanulariidae (indet.)						P									P
D	503	*Clytia hemisphaerica*														P	P
D	618	*Virgularia mirabilis*	Slender sea pen														0
D	632	*Cerianthus lloydii*				1			4							1	6
D	766	*Edwardsia claparedii*				1		1							3		5
F	2	*Turbellaria indeterminate*	Flatworms														0
F	2	*Turbellaria,* white with eyes AQ2															0
F	80	Leptoplanidae (indet.)															0
F	89	*Notoplana atomata*															0
F	102	Euryleptidae (indet.)															0
F	104	*Euryleptidae cornuta*															0
F	114	*Stylostomum ellipse*															0
G	1	*Nemertea* (indet)	Ribbon worms			10		3								3	16
G	39	*Cerebratulus* sp. (indet.)															0
G	50	*Lineus* sp. (indet.)															0
G	63	*Micrura lactea?*															0
G	133	*Tetrastemma robertianae*						1									1
N	1	Sipuncula (indet.)															0
N	25	*Nephasoma minutum*															0
N	34	*Phascolion strombus strombus*															0
P	15	*Pisione remota*														1	1
P	19	*Aphrodita aculeata*	Sea mouse														0
P	25	Polynoidae (indet.)					2										2
P	37	*Antinoella* sp. (indet- unusual?)					1										1
P	49	*Gattyana cirrosa*															0
P	50	*Harmothoe pagenstecheri*				1											1

MCS Code		Latin Name	Common Name	Conservation status	Stn1	Stn 2	Stn 3	Stn 4	Stn 5	Stn 6	Stn 7	Stn 8	Stn 9	Stn 10	Stn 11	Stn 12	Total
P	50	*Harmothoe* sp. (indet.)					1										1
P	50	*Malmgrenia* sp. (indet.)					1									1	2
P	59	*Harmothoe fragilis*															0
P	65	*Harmothoe impar*															0
P	66	*Malmgrenia ljungmani*			3		2										5
P	68	*Malmgrenia marphysae*								1							1
P	70	*Malmgrenia mcintoshi*			2		1										3
P	92	*Pholoe inornata*															0
P	93	*Pholoe pallida*															0
P	94	*Pholoe synophthalmica*			3	4	3	1	2	3	1	2			1	1	21
P	107	*Sthenelais boa*															0
P	109	*Sthenelais limicola*															0
P	114	Phyllodocidae (indet.)															0
P	118	*Eteone longa*			1	1		1		5							8
P	136	*Pseudomystides limbata*															0
P	145	*Anaitides mucosa*															0
P	146	*Phyllodoce rosea*															0
P	155	*Eulalia mustela*															0
P	163	*Eumida* sp. (indet.)					4									1	5
P	164	*Eumida bahusiensis*															0
P	169	*Nereiphylla lutea*															0
P	171	*Nereiphylla rubiginosa*							1								1
P	178	*Phyllodoce* sp. (indet.)															0
P	255	*Glycera* sp. (indet.)															0
P	256	*Glycera alba*															0
P	259	*Glycera gigantea*													1		1
P	260	*Glycera lapidum*			10		4	2								18	34
P	262	*Glycera oxycephala*			1										5		6
P	268	*Glycinde nordmanni*															0
P	271	*Goniada maculata*															0
P	282	*Ephesiella abyssorum*			5												5

MCS Code		Latin Name	Common Name	Conservation status	Stn1	Stn 2	Stn 3	Stn 4	Stn 5	Stn 6	Stn 7	Stn 8	Stn 9	Stn 10	Stn 11	Stn 12	Total
P	283	*Sphaerodoridium fauchaldii*		Recently described; under-recorded?													0
P	286	*Sphaerodoropsis balticum*			3												3
P	288	*Sphaerodoropsis minuta*					2										2
P	291	*Sphaerodorum gracilis*														1	1
P	293	Hesionidae (indet.)															0
P	305	Kefersteinia cirrata															0
P	311	*Nereimyra punctata*				1	3			1							5
P	313	*Ophiodromus flexuosus*															0
P	319	*Podarkeopsis capensis*															0
P	321	*Syllidia armata*				1											1
P	358	*Syllis* sp. (indet.)			1												1
P	358	*Syllis* sp. D															0
P	362	*Trypanosyllis coeliaca*			2		3		1							2	8
P	406	*Syllides japonica*															0
P	406	*Syllides* sp. (indet)															0
P	421	*Exogone hebes*						1							7		8
P	422	*Exogone naidina*					1		1							1	3
P	423	*Exogone verugera*															0
P	425	*Sphaerosyllis bulbosa*			31		9									22	62
P	430	*Sphaerosyllis taylori*			2		5				1				3	22	33
P	431	*Sphaerosyllis tetralix*														2	2
P	434	*Autolytus* sp. (indet.)															0
P	451	Proceraea sp. (indet.)															0
P	474	*Nereis elitoralis*															0
P	484	*Platynereis dumerilii*					2		1	1						1	5
P	487	*Websterinereis glauca*															0
P	494	*Nephtys* sp. (indet.)															0
P	497	*Nephtys ciliata*	Catworm														0
P	498	*Nephtys cirrosa*	A catworm														0
P	499	*Nephtys hombergii*	Catworm														0
P	502	*Nephtys kersivalensis*									2						2

MCS Code		Latin Name	Common Name	Conservation status	Stn1	Stn 2	Stn 3	Stn 4	Stn 5	Stn 6	Stn 7	Stn 8	Stn 9	Stn 10	Stn 11	Stn 12	Total
P	537	Onuphidae (indet.)															0
P	539	*Aponuphis bilineata*				2											2
P	568	*Nematonereis unicornis*				2				1							3
P	572	*Lumbrineris* sp. (indet.)															0
P	579	*Lumbrineris gracilis*			1				3						1		5
P	598	Dorvilleidae (indet.)															0
P	632	Parougia sp. (indet.)															0
P	638	*Protodorvillea kefersteini*			2	3			1	1		5				11	23
P	665	*Orbinia sertulata*															0
P	695	*Paradoneis* sp. (indet.)										1					1
P	699	*Paradoneis lyra*															0
P	712	*Apistobranchus tullbergi*															0
P	718	*Poecilochaetus serpens*											2		1		3
P	720	Spionidae (indet)															0
P	722	*Aonides oxycephala*				1	16		5	1						17	40
P	723	*Aonides paucibranchiata*			18	5		2								13	38
P	733	*Laonice bahusiensis*															0
P	737	*Malacoceros fuliginosus*															0
P	744	*Microspio mecznikowianus*					1										1
P	747	*Minuspio cirrifera*													1		1
P	748	Polydora sp. (indet.)															0
P	750	*Polydora caeca*															0
P	751	*Polydora caulleryi*															0
P	754	*Polydora flava*															0
P	763	*Prionospio* sp. (indet.)			1												1
P	765	*Prionospio fallax*															0
P	765	*Prionospio fallax* & *Minuspio cirrifera*															0
P	772	*Pseudopolydora antennata*															0
P	773	*Pseudopolydora paucibranchiata*															0
P	774	*Pseudopolydora pulchra*					1										1
P	776	*Pygospio elegans*							1								1
P	787	*Spio* sp. (indet.)						1									1

MCS Code		Latin Name	Common Name	Conservation status	Stn1	Stn 2	Stn 3	Stn 4	Stn 5	Stn 6	Stn 7	Stn 8	Stn 9	Stn 10	Stn 11	Stn 12	Total
P	788	*Spio armata*											4		4		8
P	789	*Spio decorata*											1				1
P	790	*Spio filicornis*						7									7
P	791	*Spio martinensis*															0
P	794	*Spiophanes bombyx*															0
P	796	*Spiophanes kroyeri*															0
P	804	*Magelona alleni*															0
P	806	*Magelona minuta*															0
P	822	Cirratulidae (indet.)															0
P	823	Aphelochaeta sp. (indet.)															0
P	828	*Caulleriella* sp. (indet.)						1									1
P	829	*Caulleriella alata*						3	1	1							5
P	832	*Chaetozone* sp. (indet.)															0
P	832	*Caulleriella zetlandica*															0
P	833	*Chaetozone gibber*															0
P	834	*Chaetozone setosa*															0
P	835	*Cirratulus* sp. (indet.)															0
P	836	*Cirratulus cirratus*															0
P	846	*Tharyx killariensis*				3			1								4
P	878	*Diplocirrus glaucus*							1								1
P	881	*Flabelligera affinis*															0
P	891	*Macrochaeta clavicornis*			3		1										4
P	907	*Capitella capitata*															0
P	919	*Mediomastus fragilis*			7	11	2	6	7	4		6			21	1	65
P	920	*Notomastus* sp. (indet.)					1										1
P	921	*Notomastus latericeus*										1					1
P	938	Maldanidae (indet.)						1									1
P	951	Euclymeninae sp. A															0
P	955	*Clymenura* sp. (indet.)															0
P	955	*Clymenura tricirrata*														2	2
P	963	*Euclymene lumbricoides*															0
P	964	*Euclymene oerstedii*															0
P	965	*Euclymene* sp. A (sensu Garwood)															0

MCS Code		Latin Name	Common Name	Conservation status	Stn1	Stn 2	Stn 3	Stn 4	Stn 5	Stn 6	Stn 7	Stn 8	Stn 9	Stn 10	Stn 11	Stn 12	Total
P	970	*Praxillella* sp. (indet.)															0
P	971	*Praxillella affinis*															0
P	971	*Praxillella gracilis*															0
P	978	*Micromaldane ornithochaeta*															0
P	990	*Rhodine gracilior*															0
P	1014	*Ophelina acuminata*															0
P	1015	*Ophelina cylindricaudata*															0
P	1016	*Ophelina modesta*															0
P	1027	*Scalibregma inflatum*				7	1		10	2		6			2	2	30
P	1063	*Polygordius appendiculatus*														2	2
P	1065	*Polygordius lacteus*			28					1							29
P	1069	*Protodrilus* sp. (indet.)														1	1
P	1093	*Galothowenia oculata*						1									1
P	1094	*Myriochele* sp. (indet.)															0
P	1095	*Myriochele danielsseni*															0
P	1098	*Owenia fusiformis*			1	2			4								7
P	1107	*Lagis koreni*						1									1
P	1118	Ampharetidae (indet.)															0
P	1124	*Melinna palmata*															0
P	1133	*Ampharete* sp. (indet.)															0
P	1139	*Ampharete lindstroemi*													3		3
P	1147	*Anobothrus gracilis*															0
P	1160	*Sabellides octocirrata*															0
P	1167	*Sosane sulcata*															0
P	1175	*Terebellides stroemi*															0
P	1178	*Trichobranchus roseus*															0
P	1179	Terebellidae (indet.)															0
P	1195	*Lanice conchilega*	Sand mason														0
P	1211	*Nicolea zostericola*															0
P	1217	*Pista cristata*				1				1				1			3
P	1235	*Polycirrus* sp.															0
P	1243	*Polycirrus norvegicus*														2	2
P	1253	*Thelepus* sp. (indet.)															0

MCS Code		Latin Name	Common Name	Conservation status	Stn1	Stn 2	Stn 3	Stn 4	Stn 5	Stn 6	Stn 7	Stn 8	Stn 9	Stn 10	Stn 11	Stn 12	Total
P	1269	*Chone filicaudata*			1		3		1								5
P	1280	*Euchone rubrocincta*															0
P	1283	*Fabricia sabella*															0
P	1290	*Jasmineira elegans*															0
P	1316	*Pseudopotamilla reniformis*															0
P	1332	*Hydroides elegans*															0
P	1334	*Hydroides norvegica*				1	1										2
P	1339	*Pomatoceros* sp. (indet.)	Keel worm				3										3
P	1340	*Pomatoceros lamarckii*	Keel worm						1							2	3
P	1341	*Pomatoceros triqueter*	Keel worm				4									5	9
P	1343	*Serpula vermicularis*							1								1
P	1420	*Paranais litoralis*								1							1
P	1489	*Tubificoides amplivasatus*			1		1			1							3
P	1491	*Tubificoides brownae*				1		10		3					3	2	19
P	1501	Enchytraeidae (indet.)													1		1
P	1524	Grania sp. (indet.)			3										2	27	32
Q	33	*Callipallene brevirostris*															0
Q	44	*Anoplodactylus petiolatus*															0
R	41	*Verruca stroemia*															0
R	76	*Balanus balanus*															0
S	6	*Nebalia bipes*					1		3						2		6
S	25	Mysidacea (indet.)				1			1					1			3
S	98	Gammaridea (indet.)			4					1			1			2	8
S	102	*Apherusa bispinosa*					2										2
S	118	Oedicerotidae (indet.)															0
S	131	*Perioculodes longimanus*															0
S	137	*Synchelidium haplocheles*															0
S	140	*Westwoodilla caecula*															0
S	156	Amphilochus sp. (indet.)															0
S	164	*Gitana sarsi*			1		2			1							4
S	170	*Paramphilochoides odontonyx*														1	1
S	176	*Leucothoe* sp. (indet.)														1	1
S	177	*Leucothoe incisa*			1												1

MCS Code		Latin Name	Common Name	Conservation status	Stn1	Stn 2	Stn 3	Stn 4	Stn 5	Stn 6	Stn 7	Stn 8	Stn 9	Stn 10	Stn 11	Stn 12	Total
S	224	*Hyale prevostii*										1					1
S	248	*Urothoe elegans*						1									1
S	252	Phoxocephalidae (indet.)			1												1
S	253	*Harpinia* sp. (indet.)															0
S	254	*Harpinia antennaria*															0
S	255	*Harpinia crenulata*							2								2
S	256	*Harpinia laevis*															0
S	265	*Parametaphoxus fultoni*			24	2	3		8	1		3				2	43
S	267	*Paraphoxus oculatus*															0
S	271	Lysianassidae (indet.)			4												4
S	274	*Acidostoma nodiferum*															0
S	305	*Lysianassa plumosa*										1					1
S	321	*Orchomene nanus*											1				1
S	330	*Socarnes erythrophthalmus*			39	1	1									50	91
S	344	*Tryphosella sarsi*															0
S	380	*Iphimedia minuta*															0
S	413	*Atylus vedlomensis*							1							8	9
S	414	*Dexamine* sp. (indet.)					1	2	2							1	6
S	415	*Dexamine spinosa*					1										1
S	418	*Guernea coalita*			33		11	4		1		1			2	20	72
S	423	*Ampelisca* sp. (indet.)								1							1
S	427	*Ampelisca brevicornis*															0
S	429	*Ampelisca diadema*															0
S	440	*Ampelisca tenuicornis*															0
S	442	*Ampelisca typica*											1				1
S	489	*Megaluropus agilis*														2	2
S	498	*Abludomelita obtusata*															0
S	500	*Melita* sp. (indet.)															0
S	503	*Cheirocratus* sp. (indet.)							1								1
S	519	*Maera othonis*															0
S	524	*Melita hergensis*															0
S	537	Isaeidae (indet.)															0
S	538	*Gammaropsis* sp. (indet.)															0

MCS Code		Latin Name	Common Name	Conservation status	Stn1	Stn 2	Stn 3	Stn 4	Stn 5	Stn 6	Stn 7	Stn 8	Stn 9	Stn 10	Stn 11	Stn 12	Total
S	539	*Gammaropsis cornuta*						1							6		7
S	541	*Gammaropsis maculata*														2	2
S	550	*Microprotopus maculatus*													1		1
S	552	*Photis longicaudata*							3								3
S	574	*Microjassa cumbrensis*													1		1
S	577	Aoridae (indet.)							1							6	7
S	579	*Aora gracilis*													1		1
S	588	*Leptocheirus hirsutimanus*					1			1		1				2	5
S	589	*Leptocheirus pectinatus*			7												7
S	605	*Corophium* sp. (indet.)														3	3
S	615	*Corophium sextonae*														3	3
S	618	*Siphonoectes kroyeranus*													3		3
S	641	*Caprella acanthifera*														1	1
S	651	*Pariambus typicus*													2		2
S	657	*Phtisica marina*					4		1				1	1			7
S	659	*Pseudoprotella phasma*															0
S	792	Gnathiidae (*praniza* – indet.)															0
S	796	*Gnathia oxyuraea*															0
S	803	*Anthura gracilis*					1										1
S	910	*Paramunna bilobata*			18		1									2	21
S	1099	Tanaidacea (indet.)															0
S	1118	*Araphura brevimana*															0
S	1133	*Leptognathia gracilis*															0
S	1140	*Pseudoparatanais batei*					1										1
S	1142	*Tanaopsis graciloides*										1					1
S	1154	*Typhlotanais microcheles*					3										3
S	1161	*Pseudotanais* sp. (indet.)															0
S	1183	*Cumacea* (indet.)															0
S	1191	*Vaunthompsonia cristata*															0
S	1200	*Iphinoe* sp. (indet.)															0
S	1201	*Iphinoe serrata*															0
S	1208	*Eudorella truncatula*															0
S	1224	*Cumella pygmaea*			3												3

MCS Code		Latin Name	Common Name	Conservation status	Stn1	Stn 2	Stn 3	Stn 4	Stn 5	Stn 6	Stn 7	Stn 8	Stn 9	Stn 10	Stn 11	Stn 12	Total
S	1226	*Nannastacus brevicaudatus*					1										1
S	1228	*Nannastacus unguiculatus*			1												1
S	1236	*Pseudocuma longicornis*															0
S	1243	*Lamprops fasciata*															0
S	1247	*Diastylis* sp. (indet.)															0
S	1253	*Diastylis rathkei typica*															0
S	1254	*Diastylis rugosa*															0
S	1257	*Diastyloides biplicata*															0
S	1362	*Processa* sp. (indet.)															0
S	1386	*Crangon bispinosus neglecta*					1								1		2
S	1445	Paguridae (indet.)	Hermit crabs				1										1
S	1460	*Pagurus cuanensis*															0
S	1472	*Galathea intermedia*					2										2
S	1482	*Pisidia longicornis*	Long-clawed porcelain crab														0
S	1584	*Liocarcinus pusillus*															0
W	9	*Chaetoderma nitidulum*															0
W	53	*Leptochiton asellus*			2												2
W	54	*Leptochiton cancellatus*		Not commonly recorded	2												2
W	71	*Ischnochiton albus*					3									2	5
W	75	*Callochiton septemvalvis*			2		1										3
W	79	*Lepidochitona cinereus*			3												3
W	88	Gastropoda (indet.)					1										1
W	152	*Margarites groenlandicus*		Rarely recorded, only Scotland in UK					1								1
W	161	*Gibbula tumida*	Flat top shell														0
W	172	*Jujubinus clelandi* (also known as Clelandella miliaris)															0
W	223	*Tectura testudinalis*														1	1
W	224	*Tectura virginea*			1		14									1	16

MCS Code		Latin Name	Common Name	Conservation status	Stn1	Stn 2	Stn 3	Stn 4	Stn 5	Stn 6	Stn 7	Stn 8	Stn 9	Stn 10	Stn 11	Stn 12	Total
W	234	*Helcion pellucidum*	Blue-rayed limpet				1										1
W	270	*Turritella communis*	Tower shell or Auger shell														0
W	292	*Lacuna vincta*	Banded chink shell								1						1
W	324	Rissoidae (indet.)															0
W	331	*Rissoa porifera*															0
W	334	*Rissoa parva*														1	1
W	344	*Alvania punctura*															0
W	371	*Onoba semicostata*					1										1
W	377	*Pusillana sarsi*														5	5
W	414	*Caecum imperforatum*														1	1
W	418	*Caecum glabrum*			2		1									2	5
W	430	*Aporrhais pespelecani*	Pelican's foot shell														0
W	488	*Polinices* sp. (juv.)														1	1
W	491	*Polinices pulchellus*					2										2
W	599	Eulimidae (indet.) mainly *Vitreolina philippi*				1										1	2
W	603	*Eulima bilineata*														1	1
W	797	*Mangelia attenuata*															0
W	798	*Mangelia brachystoma*															0
W	861	*Raphitoma linearis*							1								1
W	864	*Raphitoma boothii*															0
W	906	Pyramidellidae (indet.)					1										1
W	937	*Chrysallida indistincta*															0
W	1006	*Acteon tornatilis*															0
W	1028	*Cylichna cylindracea*			1												1
W	1036	Philine sp. (indet.)															0
W	1045	*Philine scabra*															0
W	1243	Nudibranchia (indet)														2	2
W	1270	*Doto* sp. (indet.)			1												1

MCS Code		Latin Name	Common Name	Conservation status	Stn1	Stn 2	Stn 3	Stn 4	Stn 5	Stn 6	Stn 7	Stn 8	Stn 9	Stn 10	Stn 11	Stn 12	Total
W	1360	Doridacea (indet.)					1										1
W	1519	*Antalis entails*	Elephant's tusk shell														0
W	1566	*Nucula* sp. (indet.)															0
W	1569	*Nucula nitidosa*															0
W	1570	*Nucula nucleus*															0
W	1577	*Nuculoma tenuis*															0
W	1691	Mytilidae (indet.)			8			2	5		10					8	33
W	1702	*Modiolus modiolus*	Horse mussel	BAP for Modiolus beds	148	4	64	34	3		10		5	1		272	541
W	1758	*Ostrea edulis*	European oyster	BAP													0
W	1768	Pectinidae (indet.)															0
W	1785	*Palliolum furtivum*					1									1	2
W	1805	Anomiidae (indet.)	Saddle oysters			1	1										2
W	1827	*Myrtea spinifera*															0
W	1835	T*hyasira* sp. (juv.)															0
W	1837	*Thyasira flexuosa*	Wavy hatchet shell							4							4
W	1882	*Semierycina nitida*							1								1
W	1906	*Mysella bidentata*			25		1		2	4					1	4	37
W	1943	*Acanthocardia echinata*	Prickly cockle														0
W	1952	*Parvicardium scabrum*			23		20	2	5	2			1		5		58
W	2001	*Ensis siliqua*	Pod razorshell					1									1
W	2006	*Phaxas pellucidus*	?														0
W	2012	*Angulus tenuis*	Thin tellin										7				7
W	2015	*Arcopagia crassa*															0
W	2019	*Fabulina fabula*	?												1		1
W	2021	*Moerella donacina*					1									1	2
W	2023	*Moerella pygmaea*			8	2	8	5	9	1		1			3	12	49
W	2051	*Gari fervensis*	Faroe sunset shell														0
W	2056	*Azorinus chamasolen*															0

MCS Code		Latin Name	Common Name	Conservation status	Stn1	Stn 2	Stn 3	Stn 4	Stn 5	Stn 6	Stn 7	Stn 8	Stn 9	Stn 10	Stn 11	Stn 12	Total
W	2058	*Abra* sp. (juv.)															0
W	2059	*Abra alba*															0
W	2061	*Abra nitida*															0
W	2086	Veneridae (indet.)															0
W	2095	*Gouldia minima*			2		2									1	5
W	2098	*Chamelea gallina*	Striped venus			2											2
W	2100	*Clausinella fasciata*	Banded venus		3				1		1		2		1		8
W	2104	*Timoclea ovata*	Oval venus			1											1
W	2113	*Tapes rhomboides*	Banded carpet shell		1		2	1								6	10
W	2126	*Dosinia* sp. (indet.)														6	6
W	2128	*Dosinia lupinus*					5	2	6		2	1			2	2	20
W	2130	*Dosinia exoleta*			23	2											25
W	2139	*Mysia undata*															0
W	2147	*Mya truncata*	Blunt gaper		12		3								1	3	19
W	2166	*Hiatella arctica*	Wrinkled rock borer			1	4	1									6
W	2227	*Thracia* sp. (juv.)			11	2	5				5				1	7	31
W	2231	*Thracia phaseolina*							2						9		11
W	2233	*Thracia villosiuscula*			4		17									6	27
W	2239	*Cochlodesma praetenue*															0
W	2247	*Lyonsia norwegica*															0
Y	17	*Crisia eburnea*					P										P
Y	155	*Aetea sica*															0
Y	170	*Membranipora membranacea*													P		P
Y	172	*Conopeum reticulum*															P
Y	178	*Electra pilosa*			P	P	P									P	P
Y	299	*Cellaria* sp. (indet.)															P
Y	300	*Cellaria fistulosa*															P
Y	301	*Cellaria salicornioides*															P
Y	333	*Hippothoa flagellum*															P

MCS Code		Latin Name	Common Name	Conservation status	Stn1	Stn 2	Stn 3	Stn 4	Stn 5	Stn 6	Stn 7	Stn 8	Stn 9	Stn 10	Stn 11	Stn 12	Total
Y	337	*Celleporella hyalina*															P
Y	369	*Escharella variolosa*															P
Y	474	*Schizomavella linearis*															P
Y	483	*Fenestrulina malusii*															P
ZA	3	*Phoronis* sp. (indet.)															0
ZA	5	*Phoronis muelleri*						1									1
ZB	26	*Astropecten irregularis*	Sand star		1											1	2
ZB	100	*Asterias rubens*	Common starfish														0
ZB	124	*Ophiothrix fragilis*	Common brittle star		16		23	4	2	1		1				13	60
ZB	154	*Amphiura filiformis*			2		1										3
ZB	161	*Amphipholis squamata*			47	3	10		5							26	91
ZB	166	*Ophiura* sp. (indet.)															0
ZB	168	*Ophiura albida*					1										1
ZB	193	*Psammechinus miliaris*	Shore sea urchin		2		3									3	8
ZB	212	*Echinocyamus pusillus*					1		1								2
ZB	223	*Echinocardium cordatum*	Common sea potato				1										1
ZB	224	*Echinocardium flavescens*	Yellow sea potato														0
ZB	280	*Leptopentacta elongata*															0
ZB	299	*Labidoplax buskii*															0
ZEE	1	*Brachiostoma lanceolatus*	Amphioxus													1	1
ZM	194	*Lithothamnion corallioides/Phymatolithon calcareum*	Maerl	Annex V(b) of EC Habitats Directive	P		P		P	P							P
ZM	194	Corallinaceae (crustose)	Crustose coralline red algae				P		P			P				P	P
ZM	672	*Polysiphonia nigra*				P	P	P	P	P						P	P
ZS	210	*Cladophora pygmaea*									P	P					P
		No of individuals			616	82	317	104	114	46	33	32	26	4	102	661	2137
		No of taxa			62	35	82	33	46	30	11	17	11	4	35	77	

Table A2.2. Grab sampling stations infauna data, all species.

MCS Code		Latin Name	Common Name	Conservation status	GM1	GM2	GM3	GM4	GM5	GM6	GM7	GM8	GM9	GM10	GM11	GM12	Total
C	480	*Cliona celata*			P				P	P							P
D	491	Campanulariidae (indet.)															P
D	503	*Clytia hemisphaerica*															P
D	618	*Virgularia mirabilis*	Slender sea pen								1						1
D	632	*Cerianthus lloydii*				1	1	5	1	1	1						10
D	766	*Edwardsia claparedii*			1	5	12	2		3	1	1	9	3	2		39
F	2	*Turbellaria indeterminate*	Flatworms		1	1	1	1	1	1			1		1	2	10
F	2	Turbellaria, white with eyes AQ2					1										1
F	80	Leptoplanidae (indet.)						1									1
F	89	*Notoplana atomata*								2		1					3
F	102	Euryleptidae (indet.)						1									1
F	104	*Euryleptidae cornuta*							1								1
F	114	*Stylostomum ellipse*								2							2
G	1	Nemertea (indet.)	Ribbon worms		6	6	10	12	6	8	7	2	10	5			72
G	39	*Cerebratulus* sp. (indet.)					1			5		2	3		1		12
G	50	*Lineus sp*. (indet.)			3												3
G	63	*Micrura lactea?*				1											1
G	133	*Tetrastemma robertianae*				1		1									2
N	1	Sipuncula (indet.)			4	4											8
N	25	*Nephasoma minutum*												1			1
N	34	*Phascolion strombus strombus*												1			1
P	15	*Pisione remota*															0
P	19	*Aphrodita aculeata*	Sea mouse			2	1							1	1		5
P	25	Polynoidae (indet.)															0
P	37	*Antinoella* sp. (indet.- unusual?)															0
P	49	*Gattyana cirrosa*													1	1	2
P	50	*Harmothoe pagenstecheri*								1							1
P	50	*Harmothoe* sp. (indet.)			2	1		10	1	5			1			1	21
P	50	*Malmgrenia* sp. (indet.)															0
P	59	*Harmothoe fragilis*			3			3									6

MCS Code		Latin Name	Common Name	Conservation status	GM1	GM2	GM3	GM4	GM5	GM6	GM7	GM8	GM9	GM10	GM11	GM12	Total
P	65	*Harmothoe impar*							1								1
P	66	*Malmgrenia ljungmani*															0
P	68	*Malmgrenia marphysae*															0
P	70	*Malmgrenia mcintoshi*			1			3	2								6
P	92	*Pholoe inornata*														1	1
P	93	*Pholoe pallida*												3			3
P	94	*Pholoe synophthalmica*			3	7	15	1	5	5	23	13	22		2	15	111
P	107	*Sthenelais boa*					2										2
P	109	*Sthenelais limicola*									3		3			4	10
P	114	Phyllodocidae (indet.)			1	4		1									6
P	118	*Eteone longa*			1	2	3	3	5	3		3	3	2	3	5	33
P	136	*Pseudomystides limbata*					1	5	1	2							9
P	145	*Anaitides mucosa*						1									1
P	146	*Phyllodoce rosea*					1		3		1	1		1	5	2	14
P	155	*Eulalia mustela*			1												1
P	163	*Eumida* sp. (indet.)					1			3	1			1	1	3	10
P	164	*Eumida bahusiensis*				1	2	1			4	2	2	4	3	2	21
P	169	*Nereiphylla lutea*						2	1								3
P	171	*Nereiphylla rubiginosa*						1	2								3
P	178	*Phyllodoce* sp. (indet.)							1								1
P	255	*Glycera* sp. (indet.)			2	1	2	1				1					7
P	256	*Glycera alba*				1		2		2							5
P	259	*Glycera gigantea*															0
P	260	*Glycera lapidum*			2			10	1								13
P	262	*Glycera oxycephala*							2	1	3		1	4	5	4	20
P	268	*Glycinde nordmanni*			1								2				3
P	271	*Goniada maculata*			1			1	2	6							10
P	282	*Ephesiella abyssorum*															0
P	283	*Sphaerodoridium fauchaldii*		Recently described; under-recorded?			1				1		3	2		2	9
P	286	*Sphaerodoropsis balticum*															0
P	288	*Sphaerodoropsis minuta*															0

MCS Code		Latin Name	Common Name	Conservation status	GM1	GM2	GM3	GM4	GM5	GM6	GM7	GM8	GM9	GM10	GM11	GM12	Total
P	291	*Sphaerodorum gracilis*							1								1
P	293	Hesionidae (indet.)								1							1
P	305	*Kefersteinia cirrata*								4							4
P	311	*Nereimyra punctata*			6	2		17	11	9							45
P	313	*Ophiodromus flexuosus*					2							1			3
P	319	*Podarkeopsis capensis*										1					1
P	321	*Syllidia armata*			2			5	4	11							22
P	358	*Syllis* sp. (indet.)							3					1			4
P	358	*Syllis* sp. D			2			2		3							7
P	362	*Trypanosyllis coeliaca*															0
P	406	*Syllides japonica*						1									1
P	406	*Syllides* sp. (indet.)			1												1
P	421	*Exogone hebes*			1	1	3	8	12	4	1	2	2	1	2	2	39
P	422	*Exogone naidina*			4	2	1	6	4	11	1			3	1		33
P	423	*Exogone verugera*			4	1		4									9
P	425	*Sphaerosyllis bulbosa*															0
P	430	*Sphaerosyllis taylori*			2			10		4							16
P	431	*Sphaerosyllis tetralix*				2		2		1							5
P	434	*Autolytus* sp. (indet.)			1												1
P	451	Proceraea sp. (indet.)							1								1
P	474	*Nereis elitoralis*						2		1							3
P	484	*Platynereis dumerilii*						2									2
P	487	*Websterinereis glauca*												2			2
P	494	*Nephtys* sp. (indet.)				1	5	2	1	2	5	6	4	1	3	6	36
P	497	*Nephtys ciliata*	Catworm						1								1
P	498	*Nephtys cirrosa*	A catworm													3	3
P	499	*Nephtys hombergii*	Catworm			3	4	1	1	1	4	5	3	7	8		37
P	502	*Nephtys kersivalensis*							1								1
P	537	Onuphidae (indet.)						1									1
P	539	*Aponuphis bilineata*				1		2	1	4							8
P	568	*Nematonereis unicornis*															0
P	572	*Lumbrineris* sp. (indet.)								2				3		1	6
P	579	*Lumbrineris gracilis*			20	2	6	4	6	1		1	1	1	1		43

MCS Code		Latin Name	Common Name	Conservation status	GM1	GM2	GM3	GM4	GM5	GM6	GM7	GM8	GM9	GM10	GM11	GM12	Total
P	598	Dorvilleidae (indet.)				1											1
P	632	*Parougia* sp. (indet.)						1					1		1	1	4
P	638	*Protodorvillea kefersteini*															0
P	665	*Orbinia sertulata*				1			2	1							4
P	695	*Paradoneis* sp. (indet)															0
P	699	*Paradoneis lyra*			1	8	4	18	28	13		1	6	9	1	9	98
P	712	*Apistobranchus tullbergi*				2		12	2	2							18
P	718	*Poecilochaetus serpens*															0
P	720	Spionidae (indet.)							1						1		2
P	722	*Aonides oxycephala*			3	1	1	5	3								13
P	723	*Aonides paucibranchiata*			1	1			3	2							7
P	733	*Laonice bahusiensis*								1						1	2
P	737	*Malacoceros fuliginosus*					2		1						2	3	8
P	744	*Microspio mecznikowianus*															0
P	747	*Minuspio cirrifera*				1			4				1		1		7
P	748	*Polydora* sp. (indet.)			1	1	1					1					4
P	750	*Polydora caeca*			1												1
P	751	*Polydora caulleryi*														1	1
P	754	*Polydora flava*					1	1	3	1						6	12
P	763	*Prionospio* sp. (indet.)															0
P	765	Prionospio fallax					1						1	115		2	119
P	765	*Prionospio fallax* & *Minuspio cirrifera*			1		13	5	4	7	44	60	42		130	106	412
P	772	*Pseudopolydora antennata*								4		2	3				9
P	773	*Pseudopolydora paucibranchiata*					1	3	2			1					7
P	774	*Pseudopolydora pulchra*															0
P	776	*Pygospio elegans*			3	1	2	5	2	6	2	5	5	32	4	5	72
P	787	*Spio* sp. (indet.)						4	1	1		2					8
P	788	*Spio armata*				3	1	10	8	15	20	1	3	10	8	2	81
P	789	*Spio decorata*															0
P	790	*Spio filicornis*															0
P	791	*Spio martinensis*									1			13			14
P	794	*Spiophanes bombyx*					4		1		1	3	1	1	1	1	13

MCS Code		Latin Name	Common Name	Conservation status	GM1	GM2	GM3	GM4	GM5	GM6	GM7	GM8	GM9	GM10	GM11	GM12	Total
P	796	*Spiophanes kroyeri*				3	9	3	1	4	5	4	5	1	5	10	50
P	804	*Magelona alleni*									1						1
P	806	*Magelona minuta*														1	1
P	822	Cirratulidae (indet.)				1											1
P	823	*Aphelochaeta sp*. (indet.)			1												1
P	828	*Caulleriella* sp. (indet.)															0
P	829	*Caulleriella alata*															0
P	832	*Chaetozone* sp. (indet.)			1		1			1	2	1					6
P	832	*Caulleriella zetlandica*				1		2	1	5							9
P	833	*Chaetozone gibber*						1									1
P	834	*Chaetozone setosa*				2	12	1	2		7	17	5	7	23	32	108
P	835	*Cirratulus* sp. (indet.)								1							1
P	836	*Cirratulus cirratus*												1			1
P	846	*Tharyx killariensis*			3	3	4	4	7	4	5	2		9	1		42
P	878	*Diplocirrus glaucus*				4	15	13	7		1	2	10	2		7	61
P	881	*Flabelligera affinis*								1							1
P	891	*Macrochaeta clavicornis*						1									1
P	907	*Capitella capitata*												1			1
P	919	*Mediomastus fragilis*			15	2	1	59	9	13			4	3		3	109
P	920	*Notomastus* sp. (indet.)				1											1
P	921	*Notomastus latericeus*					1					1		1		1	4
P	938	Maldanidae (indet.)															0
P	951	*Euclymeninae* sp. A														1	1
P	955	Clymenura sp. (indet.)						2									2
P	955	*Clymenura tricirrata*														2	2
P	963	*Euclymene lumbricoides*				10		1	1				3				15
P	964	*Euclymene oerstedii*									8	4	9	7	9	10	47
P	965	*Euclymene* sp. A (sensu Garwood)														2	2
P	970	*Praxillella* sp. (indet.)					2										2
P	971	*Praxillella affinis*			1		3	3	1	1	2	2	6	2	5	6	32
P	971	*Praxillella gracilis*				1											1
P	978	*Micromaldane ornithochaeta*					1										1

MCS Code		Latin Name	Common Name	Conservation status	GM1	GM2	GM3	GM4	GM5	GM6	GM7	GM8	GM9	GM10	GM11	GM12	Total
P	990	*Rhodine gracilior*											2	1		3	6
P	1014	*Ophelina acuminata*						1								1	2
P	1015	*Ophelina cylindricaudata*				1	4					1			6	1	13
P	1016	*Ophelina modesta*													2		2
P	1027	*Scalibregma inflatum*							1	1				1			3
P	1063	*Polygordius appendiculatus*															0
P	1065	*Polygordius lacteus*															0
P	1069	*Protodrilus* sp. (indet.)															0
P	1093	*Galothowenia oculata*				32	26	13	17	11	13	18	14	44	9	11	208
P	1094	*Myriochele* sp. (indet.)								1		1					2
P	1095	*Myriochele danielsseni*						2									2
P	1098	*Owenia fusiformis*			7	56	42	49	23	15	51	36	52	42	19	32	424
P	1107	Lagis koreni			12	13	11	44	6	15	8	8	7	26	8	11	169
P	1118	Ampharetidae (indet.)													1		1
P	1124	*Melinna palmata*					2	1	8	1	2		9	6	9	23	61
P	1133	*Ampharete* sp. (indet.)					1										1
P	1139	*Ampharete lindstroemi*			1	2			3								6
P	1147	*Anobothrus gracilis*					1										1
P	1160	*Sabellides octocirrata*					1										1
P	1167	*Sosane sulcata*			5			7	2	2				2			18
P	1175	*Terebellides stroemi*			1			1	2	1							5
P	1178	*Trichobranchus roseus*					1			4				1			6
P	1179	Terebellidae (indet.)						1	2	2							5
P	1195	*Lanice conchilega*	Sand mason												1		1
P	1211	*Nicolea zostericola*								1							1
P	1217	*Pista cristata*						1									1
P	1235	*Polycirrus* sp.			1								2				3
P	1243	*Polycirrus norvegicus*					1	1	3	1							6
P	1253	*Thelepus* sp. (indet.)									1						1
P	1269	*Chone filicaudata*								2							2
P	1280	*Euchone rubrocincta*			1			2	2								5
P	1283	*Fabricia sabella*			2			1		1							4
P	1290	*Jasmineira elegans*				4	1	2	1	2				1		1	12

MCS Code		Latin Name	Common Name	Conservation status	GM1	GM2	GM3	GM4	GM5	GM6	GM7	GM8	GM9	GM10	GM11	GM12	Total
P	1316	*Pseudopotamilla reniformis*			1					1							2
P	1332	*Hydroides elegans*								3							3
P	1334	*Hydroides norvegica*			1			4	1								6
P	1339	*Pomatoceros* sp. (indet.)	Keel worm		1			6									7
P	1340	*Pomatoceros lamarckii*	Keel worm														0
P	1341	*Pomatoceros triqueter*	Keel worm					8	1	4							13
P	1343	*Serpula vermicularis*								1							1
P	1420	*Paranais litoralis*															0
P	1489	*Tubificoides amplivasatus*															0
P	1491	*Tubificoides brownae*															0
P	1501	Enchytraeidae (indet.)															0
P	1524	*Grania* sp. (indet.)															0
Q	33	*Callipallene brevirostris*			1					1							2
Q	44	*Anoplodactylus petiolatus*				1	5										6
R	41	*Verruca stroemia*			23			2	10	6					1		42
R	76	*Balanus balanus*			41		1	39	41	206			1		1		330
S	6	*Nebalia bipes*															0
S	25	Mysidacea (indet.)															0
S	98	Gammaridea (indet.)										1			1		2
S	102	*Apherusa bispinosa*															0
S	118	Oedicerotidae (indet.)						1									1
S	131	*Perioculodes longimanus*				1	1				1	4	1				8
S	137	*Synchelidium haplocheles*						2		2	2	2					8
S	140	*Westwoodilla caecula*										1				1	2
S	156	*Amphilochus* sp. (indet)				1											1
S	164	*Gitana sarsi*															0
S	170	*Paramphilochoides odontonyx*														1	1
S	176	*Leucothoe* sp. (indet.)														1	1
S	177	*Leucothoe incisa*															0
S	224	*Hyale prevostii*															0
S	248	*Urothoe elegans*				1	3	1		6	10	3	4		1	3	32
S	252	Phoxocephalidae (indet.)															0
S	253	*Harpinia* sp. (indet.)				1	3	8		3	5	1			7		28

MCS Code		Latin Name	Common Name	Conservation status	GM1	GM2	GM3	GM4	GM5	GM6	GM7	GM8	GM9	GM10	GM11	GM12	Total
S	254	*Harpinia antennaria*					1			4	2			4	2	1	14
S	255	*Harpinia crenulata*							1								1
S	256	*Harpinia laevis*				2											2
S	265	*Parametaphoxus fultoni*						8		1							9
S	267	*Paraphoxus oculatus*			1												1
S	271	Lysianassidae (indet.)			2												2
S	274	*Acidostoma nodiferum*												1		1	2
S	305	*Lysianassa plumosa*						1									1
S	321	*Orchomene nanus*				3				1				2			6
S	330	*Socarnes erythrophthalmus*															0
S	344	*Tryphosella sarsi*							2								2
S	380	*Iphimedia minuta*						9	1								10
S	413	*Atylus vedlomensis*				2		3	1								6
S	414	*Dexamine* sp. (indet.)									2						2
S	415	*Dexamine spinosa*															0
S	418	*Guernea coalita*															0
S	423	*Ampelisca* sp. (indet.)			2	4	3	10	6	6	2		10	4	5	2	54
S	427	*Ampelisca brevicornis*									3	6					9
S	429	*Ampelisca diadema*						5	2								7
S	440	*Ampelisca tenuicornis*					3	7			1		3		2	5	21
S	442	*Ampelisca typica*							1	1	1			8			11
S	489	*Megaluropus agilis*															0
S	498	*Abludomelita obtusata*										4		2	3	7	16
S	500	*Melita* sp. (indet.)					1										1
S	503	*Cheirocratus* sp. (indet.)				1		1		1							3
S	519	*Maera othonis*								2							2
S	524	*Melita hergensis*									6		1				7
S	537	Isaeidae (indet.)				1											1
S	538	*Gammaropsis* sp. (indet.)												1			1
S	539	*Gammaropsis cornuta*															0
S	541	*Gammaropsis maculata*								3							3
S	550	*Microprotopus maculatus*															0
S	552	*Photis longicaudata*						3	2	1		2		18			26

MCS Code		Latin Name	Common Name	Conservation status	GM1	GM2	GM3	GM4	GM5	GM6	GM7	GM8	GM9	GM10	GM11	GM12	Total
S	574	*Microjassa cumbrensis*															0
S	577	Aoridae (indet.)				1							2	1			4
S	579	*Aora gracilis*															0
S	588	*Leptocheirus hirsutimanus*				2											2
S	589	*Leptocheirus pectinatus*					1	1		2							4
S	605	*Corophium* sp. (indet.)															0
S	615	*Corophium sextonae*															0
S	618	*Siphonoectes kroyeranus*															0
S	641	*Caprella acanthifera*															0
S	651	*Pariambus typicus*						1		1							2
S	657	*Phtisica marina*			1	1	1	2									5
S	659	*Pseudoprotella phasma*						1	2								3
S	792	Gnathiidae (*praniza* – indet.)													1		1
S	796	*Gnathia oxyuraea*								1							1
S	803	*Anthura gracilis*															0
S	910	*Paramunna bilobata*															0
S	1099	Tanaidacea (indet.)								1				1			2
S	1118	*Araphura brevimana*					3										3
S	1133	*Leptognathia gracilis*				1		1	2	3		2	1	3	2		15
S	1140	*Pseudoparatanais batei*						2	1	3							6
S	1142	*Tanaopsis graciloides*															0
S	1154	*Typhlotanais microcheles*															0
S	1161	*Pseudotanais* sp. (indet.)					1										1
S	1183	Cumacea (indet.)										1					1
S	1191	*Vaunthompsonia cristata*						5		1							6
S	1200	*Iphinoe* sp. (indet.)													1		1
S	1201	*Iphinoe serrata*										1	2			1	4
S	1208	*Eudorella truncatula*						6					2	10			18
S	1224	*Cumella pygmaea*															0
S	1226	*Nannastacus brevicaudatus*															0
S	1228	*Nannastacus unguiculatus*															0
S	1236	*Pseudocuma longicornis*												1			1
S	1243	*Lamprops fasciata*					1										1

MCS Code		Latin Name	Common Name	Conservation status	GM1	GM2	GM3	GM4	GM5	GM6	GM7	GM8	GM9	GM10	GM11	GM12	Total
S	1247	*Diastylis* sp. (indet.)											1				1
S	1253	*Diastylis rathkei typica*											1			2	3
S	1254	*Diastylis rugosa*								1							1
S	1257	*Diastyloides biplicata*													1		1
S	1362	*Processa* sp. (indet.)										2					2
S	1386	*Crangon bispinosus neglecta*															0
S	1445	Paguridae (indet.)	Hermit crabs					1									1
S	1460	*Pagurus cuanensis*					1					1					2
S	1472	*Galathea intermedia*						2		3							5
S	1482	*Pisidia longicornis*	Long-clawed porcelain crab							1							1
S	1584	*Liocarcinus pusillus*												1			1
W	9	*Chaetoderma nitidulum*				2											2
W	53	*Leptochiton asellus*			3												3
W	54	*Leptochiton cancellatus*		Not commonly recorded													0
W	71	*Ischnochiton albus*				1		1	1	3							6
W	75	*Callochiton septemvalvis*															0
W	79	*Lepidochitona cinereus*															0
W	88	Gastropoda (indet.)								1							1
W	152	*Margarites groenlandicus*		Rarely recorded, only Scotland in UK													0
W	161	*Gibbula tumida*	Flat top shell					1									1
W	172	*Jujubinus clelandi* (also known as *Clelandella miliaris*)				1											1
W	223	*Tectura testudinalis*															0
W	224	*Tectura virginea*															0
W	234	*Helcion pellucidum*	Blue-rayed limpet														0
W	270	*Turritella communis*	Tower shell or Auger shell				10	2		1	16	13	8	9	26	42	127
W	292	*Lacuna vincta*	Banded chink shell														0

MCS Code		Latin Name	Common Name	Conservation status	GM1	GM2	GM3	GM4	GM5	GM6	GM7	GM8	GM9	GM10	GM11	GM12	Total
W	324	Rissoidae (indet.)				1											1
W	331	*Rissoa porifera*				1											1
W	334	*Rissoa parva*			1												1
W	344	*Alvania punctura*				1											1
W	371	*Onoba semicostata*															0
W	377	*Pusillana sarsi*															0
W	414	*Caecum imperforatum*															0
W	418	*Caecum glabrum*															0
W	430	*Aporrhais pespelecani*	Pelican's foot shell											1			1
W	488	*Polinices* sp. (juv.)															0
W	491	*Polinices pulchellus*	?			1	2	3	1	1	2						10
W	599	Eulimidae (indet.) mainly *Vitreolina philippi*				4	2	1	1					1			9
W	603	*Eulima bilineata*															0
W	797	*Mangelia attenuata*													1		1
W	798	*Mangelia brachystoma*														1	1
W	861	*Raphitoma linearis*															0
W	864	*Raphitoma boothii*			1												1
W	906	Pyramidellidae (indet.)															0
W	937	*Chrysallida indistincta*												1			1
W	1006	*Acteon tornatilis*				1	5	2		2	1	1				1	13
W	1028	*Cylichna cylindracea*				1	4	1	1		6	2	6		7	7	35
W	1036	*Philine* sp. (indet.)										1		1			2
W	1045	*Philine scabra*					4						5			1	10
W	1243	Nudibranchia (indet.)									2						2
W	1270	*Doto* sp. (indet.)															0
W	1360	Doridacea (indet.)															0
W	1519	*Antalis entalis*	Elephant's tusk shell				1										1
W	1566	*Nucula* sp. (indet.)			1		1						1				3
W	1569	Nucula nitidosa				4	4										8
W	1570	Nucula nucleus				5		12	10	7		1	11	2	6	4	58

MCS Code		Latin Name	Common Name	Conservation status	GM1	GM2	GM3	GM4	GM5	GM6	GM7	GM8	GM9	GM10	GM11	GM12	Total
W	1577	*Nuculoma tenuis*				2	6										8
W	1691	Mytilidae (indet.)				2	1	1				1	1				6
W	1702	*Modiolus modiolus*	Horse mussel	BAP for Modiolus beds	12	7	16	6	14	3	11	10	7	4	1	5	96
W	1758	*Ostrea edulis*	European oyster	BAP	1												1
W	1768	Pectinidae (indet.)												1			1
W	1785	*Palliolum furtivum*															0
W	1805	Anomiidae (indet.)	Saddle oysters					3	10	4							17
W	1827	*Myrtea spinifera*				1											1
W	1835	*Thyasira* sp. (juv.)														2	2
W	1837	*Thyasira flexuosa*	Wavy hatchet shell			6	23	5	3	11	12	12	14	14	13	14	127
W	1882	*Semierycina nitida*			2			2									4
W	1906	*Mysella bidentata*			1	10	144	7	3	5	124	103	149	40	85	171	842
W	1943	*Acanthocardia echinata*	Prickly cockle				5							1			6
W	1952	*Parvicardium scabrum*						5	1	2				1			9
W	2001	*Ensis siliqua*	Pod razorshell														0
W	2006	*Phaxas pellucidus*	?				2				4	1	2	2	1	2	14
W	2012	*Angulus tenuis*	Thin tellin														0
W	2015	*Arcopagia crassa*										1				1	2
W	2019	*Fabulina fabula*	?								2						2
W	2021	*Moerella donacina*						3									3
W	2023	*Moerella pygmaea*					1	3		1							5
W	2051	*Gari fervensis*	Faroe sunset shell			1	1	1									3
W	2056	*Azorinus chamasolen*				1											1
W	2058	*Abra* sp. (juv.)									2		1				3
W	2059	*Abra alba*				1	12		2		5	2	11	20	27	27	
W	2061	*Abra nitida*				1	2			2		1	3			1	10
W	2086	Veneridae (indet.)			1												1
W	2095	*Gouldia minima*					3	4	8		1	3	1		3	2	25
W	2098	*Chamelea gallina*	Striped venus			5	2				1		2			2	12

MCS Code		Latin Name	Common Name	Conservation status	GM1	GM2	GM3	GM4	GM5	GM6	GM7	GM8	GM9	GM10	GM11	GM12	Total
W	2100	*Clausinella fasciata*	Banded venus					2		1				2			5
W	2104	*Timoclea ovata*	Oval venus		12	1		19	16	12		1					61
W	2113	*Tapes rhomboides*	Banded carpet shell			1											1
W	2126	*Dosinia* sp. (indet)															0
W	2128	*Dosinia lupinus*				4	11	19	4	4			1	4			47
W	2130	*Dosinia exoleta*															0
W	2139	*Mysia undata*										1					1
W	2147	*Mya truncata*	Blunt gaper			1	10	1						7			19
W	2166	*Hiatella arctica*	Wrinkled rock borer			1		9	2	3		1					16
W	2227	*Thracia* sp. (juv.)			1	3	7	24	28	20	2	1	12	1		6	105
W	2231	*Thracia phaseolina*			8								1	5			14
W	2233	*Thracia villosiuscula*						3		3	4			1			11
W	2239	*Cochlodesma praetenue*				1											1
W	2247	*Lyonsia norwegica*						1									1
Y	17	*Crisia eburnea*															P
Y	155	*Aetea sica*						P	1								1
Y	170	*Membranipora membranacea*															P
Y	172	*Conopeum reticulum*						P	P	P							P
Y	178	*Electra pilosa*			P												P
Y	299	*Cellaria* sp. (indet.)						P									P
Y	300	*Cellaria fistulosa*							P								P
Y	301	*Cellaria salicornioides*			P				P								P
Y	333	*Hippothoa flagellum*							P								P
Y	337	*Celleporella hyalina*											P				P
Y	369	*Escharella variolosa*			P												P
Y	474	*Schizomavella linearis*			P					P							P
Y	483	*Fenestrulina malusii*									P						P
ZA	3	*Phoronis* sp. (indet.)												1			1
ZA	5	*Phoronis muelleri*			1	21	21	5	2	10	31	8	5	22	16	12	154
ZB	26	*Astropecten irregularis*	Sand star				1	1	1			1					4
ZB	100	*Asterias rubens*	Common star		1			1									2

MCS Code		Latin Name	Common Name	Conservation status	GM1	GM2	GM3	GM4	GM5	GM6	GM7	GM8	GM9	GM10	GM11	GM12	Total
ZB	124	*Ophiothrix fragilis*	Common brittle star		2	1		10									13
ZB	154	*Amphiura filiformis*				12	58			3	25	20	60	7	17	42	244
ZB	161	*Amphipholis squamata*			1	1	7	3	1	3	1	1	4	6	1		29
ZB	166	*Ophiura* sp. (indet.)						6	1	3							10
ZB	168	*Ophiura albida*					2							2	1	4	9
ZB	193	*Psammechinus miliaris*	Shore sea urchin		7			4		1							12
ZB	212	*Echinocyamus pusillus*						4		1							5
ZB	223	*Echinocardium cordatum*	Common sea potato								3	3	5	8	1	2	22
ZB	224	*Echinocardium flavescens*	Yellow sea potato			2	1	1	1								5
ZB	280	*Leptopentacta elongata*														1	1
ZB	299	*Labidoplax buskii*					2						3				5
ZEE	1	*Brachiostoma lanceolatus*	Amphioxus														0
ZM	194	*Lithothamnion corallioides/Phymatolithon calcareum*	Maerl	Annex V(b) of EC Habitats Directive		P											P
ZM	194	Corallinaceae (crustose)	Crustose coralline red algae		P			P	P								P
ZM	672	*Polysiphonia nigra*						P	P								P
ZS	210	*Cladophora pygmaea*															P
																	P
		No of individuals			268	341	647	733	433	629	521	434	603	607	521	724	6354
		No of taxa			79	101	102	143	108	123	65	73	73	86	65	79	

APPENDIX 3. TOWED VIDEO AND STILLS DATA

Table A3.1. Towed video and stills, all species.

SAMPLING STATION	TR 12	TR 13	TR 14	TR 15	TR 16	TR 17	TR 18	TR 19	TR 20	TR 21	TR 22	TR 23	TR 24	TR 25	TR 26	TR 27	TR 28	TR 29	TR 30	TR 31
Nemertesia antennina	R								R	R					R		R		R	
Nemertersia ramosa	R		R																	
Cerianthus lloydii	C	C	C	O	R		F	O	R	R	F		C			C	O		R	R
Analosoma eddystonense														P						
Pomatoceros sp.			P			P		P								P				
Serpulidae indet. (tubes)		P				P		P								P			P	
Terebellidae indet.	O	O		O																
Chaetopterus variopedatus		F															P	P		
Myxicola sarsi																R	O		O	
Carcinus maenus																				
Liocarcinus depurator						R	R			R			R	R	O	P	R	R		
Hyas sp.																	R		R	
Macropodia sp.													R							
Pagurus bernhardus											R	R					R		P	
Munida rugosa					P			P								P	P			
Nephrops norvegicus																				P
Balanus balanus	P	P				P		P	P		C									
Turritella communis			C	F	F			O				C	A	F	A	C	F	F	A	A
Pecten maximus (juv.)	P																			
Bivalvia indet. (siphons seen)															P					
Onchidoris bilamellata	C																			

SAMPLING STATION	TR 12	TR 13	TR 14	TR 15	TR 16	TR 17	TR 18	TR 19	TR 20	TR 21	TR 22	TR 23	TR 24	TR 25	TR 26	TR 27	TR 28	TR 29	TR 30	TR 31
Marthasterias glacialis	P	P																		
Asterias rubens (juv.)		R	R	R	R									R						
Henricia sp.										R	R									
Luidia ciliaris		P					P													
Porania pulvillus	O	O															R		R	R
Ophiura ophiura			O									F	F		R				F	
Ophiura albida						R	R	R				A	F		R		C	C	A	A
Amphiura sp.				A							A	A	A	A	A			A		
Psammechinus milaris	P																			
Corella parallelogramma								R									R			
Ascidia mentula									R											
Pomatoschistus pictus						R														
Gobidae indet.													P							
red algal turf indet.						O														
coralline crusts	R	R				R			R											

Table A3.2. Towed video and stills log: location, description, species noted, stills taken (all positions OSGB36).

Stn No	WP	Date	Time	Start lattitude	Start longitude	End lattitude	End longitude	Depth (m)	Description	Notes
TR 14	215	31/08/2010	15:09					24		camera problems, aborted
TR 14	217	31/08/2010	15:35					24.5		camera problems, aborted
TR 27	228	31/08/2010	18:06	55.53616	-5.10768	55.53596	-5.10751	19	Sand or muddy sand with shells and *Cerianthus lloydii, Myxicola sarsi, Pomatoceros sp., Serpulidae* indet (tubes), *Turritella communis, Carcinus maenus, Munida rugosa,*	camera focus slightly out. 24 stills
TR 28	222	31/08/2010	18:18	55.53452	-5.10691			24	Sand or muddy sand with burrows and *Turritella communis*	Re-run as stills camera did not fire
TR 28		31/08/2010	18:40	55.53456	-5.10648	55.53458	-5.10618	24	Sand or muddy sand with burrows, few stones, *Nemertesia antinnina, Cerianthus lloydii, Myxicola sarsi, Chaetopterus variopedatus, Turritella communis, Liocarcinus depurator, Hyas* sp., *Pagurus bernhardus, Munida rugosa, Porania pulvillus, Ophiura albida, Corella parallelogramma*	24 stills
TR 29	225	31/08/2010	18:55	55.53328	-5.10449	55.53326	-5.10469	28	Sand or muddy sand with burrows and *Turritella communis*	Aborted soon after bottom reached -end of tape
TR 29	225	31/08/2010	19:57	55.53336	-5.10449	55.53321	-5.10423	29	Sand or muddy sand with burrows, *Chaetopterus variopedatus, Turritella communis, Liocarcinus depurator, Ophiura albida, Amphiura* sp.,	Re-run. 8 stills
TR 12	233	01/09/2010	10:58	55.54829	-5.07513	55.54839	-5.07474	19	Mixed sediment, large amounts of shells and shell fragments, stones, stone gravel, sand.Few burrows. Coralline crusts, *Nemertesia antennina, Nemertesia ramosa, Cerianthus lloydii, Terebellidae* indet., *Balanus balanus, Pecten maximus* (juv.), *Onchidoris bilamellata*, *Porania pulvillus, Marthasterias glacialis, Psammechinus milaris*	25 stills

Stn No	WP	Date	Time	Start lattitude	Start longitude	End lattitude	End longitude	Depth (m)	Description	Notes
TR 13	235	01/09/2010	11:13	55.54677	-5.07476	55.54682	-5.07417	20	Mixed sediment, large amounts of shells and shell fragments, stones, stone gravel, sand. Few burrows. Coralline crusts, *Cerianthus lloydii, Terebellidae* indet., *Chaetopterus variopedatus, Serpulidae* indet (tubes), *Balanus balanus, Asterias rubens* (juv.), *Porania pulvillus, Marthasterias glacialis, Luidia ciliaris*	28 stills
TR 14	237	01/09/2010	11:30	55.54494	-5.07483	55.54514	-5.07423	22	Mixed sediment, large amounts of shells and shell fragments, sand with some stones. Few burrows and mounds. *Nemertesia ramosa, Cerianthus lloydii, Pomatocerso sp., Turritella communis, Asterias rubens* (juv.), *Ophiura ophiura*	27 stills
TR 15	239	01/09/2010	11:50					27	Sand or muddy sand with burrows and *Turritella communis*	Re-run as stills camera did not fire
TR 15	239	01/09/2010	12:10					27	Sand or muddy sand with burrows and *Turritella communis*	Re-run as stills camera did not fire
TR 15	239	01/09/2010	12:19	55.54274	-5.07437	55.54275	-5.07384	27	Sand or muddy sand with few small burrows *Cerianthus lloydii*, *Terebellidae* indet., *Turritella communis, Asterias rubens* (juv.), *Amphiura* sp. (arms visible)	28 stills
TR 16	244	01/09/2010	12:39	55.54121	-5.07422	55.54131	-5.07384	30	Sand or muddy sand with few small burrows *Cerianthus lloydii, Turritella communis, Munida rugosa, Asterias rubens* (juv.),	27 stills
TR 17	246	01/09/2010	13:10	55.54328	-5.08311	55.54324	-5.08221	19	Mixed sediment, large amounts of shells and shell fragments, stones, stone gravel, sand.Few burrows and mounds. coralline crusts, red algal turf (on stones), *Serpulidae* indet (tubes), *Pomatoceros* sp., *Liocarcinus depurator, Balanus balanus, Ophiura albida, Pomatoschistus pictus*,	27 stills

Stn No	WP	Date	Time	Start lattitude	Start longitude	End lattitude	End longitude	Depth (m)	Description	Notes
TR 18	248	01/09/2010	13:34	55.5421	-5.08325	55.54174	-5.08296	21	Mixed sediment, large amounts of shells and shell fragments, stones, stone gravel, sand.Few burrows and mounds *Cerianthus lloydii*, *Liocarcinus depurator, Luidia ciliaris, Ophiura albida*	24 stills
TR 19	250	01/09/2010	13:50	55.53983	-5.08263	55.53972	-5.08193	not logged	Mixed sediment, large amounts of shells and shell fragments, stones, stone gravel, sand.Few burrows.*Cerianthus lloydii, Serpulidae* indet (tubes), *Pomatoceros* sp., *Munida rugosa*, *Balanus balanus, Turritella communis, Ophiura albida, Corella parallelogramma*	27 stills
TR 20	252	01/09/2010	14:09	55.54131	-5.08690	55.54117	-5.08634	19	Mixed sediment, large amounts of shells and shell fragments, stones, stone gravel, sand.Few burrows*. Nemertesia antennina, Cerianthus lloydii, Balanus balanus, Ascidia mentula*, coralline crusts.	22 stills
TR 21	254	01/09/2010	15:47	55.53955	-5.08648	55.53956	-5.08605	22	Mixed sediment, shell fragments, stones, stone gravel, sand.Few burrows.*Cerianthus lloydii, Nemertesia antennina, Liocarcinus depurator, Henricia* sp.,	15 stills
TR 22	256	01/09/2010	16:02	55.54258	-5.09262	55.54272	-5.09241	22	Sand or muddy sand with burrows and *Cerianthus lloydii, Pagurus bernhardus, Turritella communis, Henricia* sp.*, Amphiura* sp.,	18 stills
TR 23	258	01/09/2010	16:23	55.54115	-5.09228	55.54117	-5.09161	26	Sand or muddy sand with burrows, dense *Pagurus bernhardus, Turritella communis, Amphiura* sp., *Ophiura albida, Ohiura ophiura*	19 stills
TR 24	260	01/09/2010	16:47	55.53889	-5.09238	55.53899	-5.09185	29	Sand or muddy sand with burrows *Cerianthus lloydii, Liocarcinus depurator, Macropodia* sp., *Turritella communis, Amphiura sp., Ophiura albida, Ophiura ophiura, Gobidae* indet.	22 stills

Stn No	WP	Date	Time	Start lattitude	Start longitude	End lattitude	End longitude	Depth (m)	Description	Notes
TR 25	262	01/09/2010	17:00					32		Aborted
TR 25	262	01/09/2010	17:31	55.53714	-5.09702	55.53737	-5.09680	32	Sand or muddy sand with burrows *Analosoma eddystonense, Turritella communis, Liocarcinus depurator, Amphiura* sp., *Asterias rubens* (juv.),	Repeat. 25 stills
TR 26	265	01/09/2010	17:40	55.5383	-5.09914	55.5386	-5.09949	30	Sand or muddy sand with burrows *Nemertesia antennina, Turritella communis*, bivalvia indet. (siphons), *Liocarcinus depurator, Amphiura* sp., *Ophiura albida, Ophiura ophiura*	25 stills
TR30	267	01/09/2010	18:30	55.53092	-5.10165	55.53101	-5.10145	29	Sand or muddy sand with burrows, *Nemertesia anteninna, Cerianthis lloydii, Myxicola sarsi,* calcaerous tubeworms indet., *Turritella communis, Hyas* sp., *Pagurus bernhardus, Ophiura ophiura, Ophiura albida, Porania pulvillus*	25 stills
TR 31	269	01/09/2010	18:41	55.52963	-5.09656	55.52951	-5.09666	30	Sand or muddy sand with burrows *Cerianthis lloydii, Turritella communis, Nephrops, norvegicus, Ophiura albida, Porania pulvillus*	25 stills

APPENDIX 4. VIDEO LOG

Table A4.1. video log (WGS 84)

Tape	Date	Dive/Tow	Surveyors	Start time	End time	Start TC	End TC	Start Lat (N)	Start Long (W)	Depth (m) BCD	Clip	Original format	Digitised format
Tape 6	26/08/2010	Dive 1 Pt1	LB, KB	14:08:06	14:48:32	0:17:40:17	0:22:24:22	55.54894	5.080944	4	Lamlash2010_D1_1	miniDV	H.264
Tape 6	26/08/2010	Dive 1 Pt2	LB, KB	14:48:30	15:39:26	0:22:23:03	0:25:20:05	55.54894	5.080944	4	Lamlash2010_D1_2	miniDV	H.264
Tape 6	26/08/2010	Dive 2 Pt1	CM, SLL	16:14:53	16:35:43	0:25:58:05	0:31:22:13	55.55046	5.079694	11	Lamlash2010_D2_1	miniDV	H.264
Tape 6	26/08/2010	Dive 2 Pt2	CM, SLL	16:52:21	16:55:35	0:31:42:21	0:34:56:20	55.55046	5.079694	11	Lamlash2010_D2_2	miniDV	H.264
Tape 7	27/08/2010	Dive 3 Pt1	LB, KB	11:06:00	11:48:00	0:00:00:23	0:08:25:09	55.54791	5.079639	6.5	Lamlash2010_D3_1	miniDV	H.264
Tape 7	27/08/2010	Dive 3 Pt2	LB, KB	11:48:10	12:10:13	0:08:34:18	0:10:35:10	55.54791	5.079639	6.5	Lamlash2010_D3_2	miniDV	H.264
Tape 7	27/08/2010	Dive 4 Pt1	CM, SLL	12:40:42	13:03:36	0:10:47:04	0:16:39:21	55.55069	5.081138	7	Lamlash2010_D4_1	miniDV	H.264
Tape 7	27/08/2010	Dive 4 Pt2	CM, SLL	13:14:52	13:18:25	0:16:42:06	0:20:14:24	55.55069	5.081138	7	Lamlash2010_D4_2	miniDV	H.264
Tape 7	27/08/2010	Dive 5 Pt1	LB, KB	15:21:52	15:53:53	0:21:03:01	0:26:16:16	55.55113	5.080277	12	Lamlash2010_D5_1	miniDV	H.264
Tape 7	27/08/2010	Dive 5 Pt2	LB, KB	15:54:03	15:56:25	0:26:20:20	0:28:48:18	55.55113	5.080277	12	Lamlash2010_D5_2	miniDV	H.264
Tape 7	28/08/2010	Dive 6 Pt1	CM, SLL	11:16:42	11:43:17	0:00:17:19	0:07:02:08	55.54567	5.092946	8	Lamlash2010_D6_1	miniDV	H.264
Tape 7	28/08/2010	Dive 6 Pt2	CM, SLL	11:56:35	12:00:38	0:07:08:03	0:11:11:00	55.54567	5.092946	8	Lamlash2010_D6_1	miniDV	H.264
Tape 7	28/08/2010	Dive 7	LB, KB	12:46:49	13:07:51	0:12:29:11	0:18:14:11	55.54429	5.095536	6.5	Lamlash2010_D7	miniDV	H.264
Tape 7	28/08/2010	Dive 8	CM, SLL	15:04:20	15:27:42	0:19:07:12	0:24:16:22	55.54261	5.098056	10	Lamlash2010_D8_1	miniDV	H.264
Tape 8	29/08/2010	Dive 9 Pt1	LB, KB	11:50:39	12:17:49	0:00:36:15	0:05:27:12	55.54047	5.103861	3	Lamlash2010_D9	miniDV	H.264
Tape 8	28/08/2010	Dive 9 Pt2	LB, KB	12:17:56	12:20:09	0:05:34:09	0:07:48:24	55.54261	5.098056	10	Lamlash2010_D8_2	miniDV	H.264
Tape 8	29/08/2010	Dive 10 Pt1	CM, SLL	13:24:00	13:48:18	0:09:07:01	0:16:51:19	55.53905	5.107495	8.5	Lamlash2010_D10_1	miniDV	H.264

Tape	Date	Dive/Tow	Surveyors	Start time	End time	Start TC	End TC	Start Lat (N)	Start Long (W)	Depth (m) BCD	Clip	Original format	Digitised format
Tape 8	29/08/2010	Dive 10 Pt2	CM, SLL	13:58:38	14:02:06	0:17:13:21	0:20:42:05	55.53905	5.107495	8.5	Lamlash2010_D10_2	miniDV	H.264
Tape 8	29/08/2010	Dive 11 Pt1	LB, KB	15:47:54	16:04:50	0:21:12:19	0:26:37:01	55.53877	5.108912	6	Lamlash2010_D11_1	miniDV	H.264
Tape 8	29/08/2010	Dive 11 Pt2	LB, KB	16:16:31	16:19:25	0:26:59:00	0:29:52:20	55.53877	5.108912	6	Lamlash2010_D11_2	miniDV	H.264
Tape 8	29/08/2010	Dive 12 Pt1	CM, SLL	17:14:21	17:30:38	0:37:21:05	0:42:46:21	55.54838	5.082333	5	Lamlash2010_D12_1	miniDV	H.264
Tape 8	29/08/2010	Dive 12 Pt2	CM, SLL	17:47:17	17:50:07	0:43:19:09	0:46:11:17	55.54838	5.082333	5	Lamlash2010_D12_1	miniDV	H.264
Tape 10	31/08/2010	TR27	CM, SLL, LB, KB	18:10:11	18:14:01	0:18:08:04	0:21:58:10	55.53613	5.108814	17	Lamlash2010_TR27	miniDV	H.264
Tape 10	31/08/2010	TR28	CM, SLL, LB, KB	18:40:59	18:45:06	0:42:44:17	0:46:51:16	55.53453	5.107614	22	Lamlash2010_TR28	miniDV	H.264
Tape 11	31/08/2010	TR29	CM, SLL, LB, KB	20:00:09	20:03:29	0:05:21:14	0:08:41:07	55.53333	5.105624	26	Lamlash2010_TR29	miniDV	H.264
Tape 11	01/09/2010	TR12	CM, SLL, LB, KB	11:02:38	11:07:42	0:11:49:15	0:16:53:13	55.54825	5.076269	17	Lamlash2010_TR12	miniDV	H.264
Tape 11	01/09/2010	TR13	CM, SLL, LB, KB	11:18:42	11:24:23	0:19:36:18	0:25:17:16	55.54674	5.075899	18	Lamlash2010_TR13	miniDV	H.264
Tape 11	01/09/2010	TR14	CM, SLL, LB, KB	11:35:04	11:40:19	0:29:06:21	0:34:21:07	55.54491	5.075969	20	Lamlash2010_TR14	miniDV	H.264
Tape 11	01/09/2010	TR15	CM, SLL, LB, KB	11:55:44	12:00:48	0:39:09:01	0:44:12:21	55.54271	5.075509	25	Lamlash2010_TR15	miniDV	H.264
Tape 12	01/09/2010	TR16	CM, SLL, LB, KB	12:44:01	12:48:43	0:01:50:00	0:06:31:12	55.54118	5.075359	28	Lamlash2010_TR16	miniDV	H.264
Tape 12	01/09/2010	TR17	CM, SLL, LB, KB	13:19:42	13:25:00	0:11:08:22	0:16:26:20	55.54325	5.084248	17	Lamlash2010_TR17	miniDV	H.264
Tape 12	01/09/2010	TR18	CM, SLL, LB, KB	13:39:21	13:44:26	0:22:33:19	0:27:38:24	55.54207	5.084098	19	Lamlash2010_TR18	miniDV	H.264
Tape 12	01/09/2010	TR19	CM, SLL, LB, KB	13:55:23	14:00:32	0:31:20:03	0:36:28:13	55.5398	5.083768	Not logged	Lamlash2010_TR19	miniDV	H.264
Tape 12	01/09/2010	TR20	CM, SLL, LB, KB	14:12:36	14:17:31	0:39:17:20	0:44:12:14	55.54128	5.088037	17	Lamlash2010_TR20	miniDV	H.264
Tape 13	01/09/2010	TR21	CM, SLL, LB, KB	15:54:18	15:59:19	0:03:14:09	0:08:15:11	55.39549	5.087612	20	Lamlash2010_TR21	miniDV	H.264
Tape 13	01/09/2010	TR22	CM, SLL, LB, KB	16:10:20	16:15:27	0:11:00:22	0:16:07:20	55.54255	5.093756	20	Lamlash2010_TR22	miniDV	H.264

Tape	Date	Dive/Tow	Surveyors	Start time	End time	Start TC	End TC	Start Lat (N)	Start Long (W)	Depth (m) BCD	Clip	Original format	Digitised format
Tape 13	01/09/2010	TR23	CM, SLL, LB, KB	16:28:05	16:33:23	0:19:15:09	0:24:33:02	55.54112	5.093416	24	Lamlash2010_TR23	miniDV	H.264
Tape 13	01/09/2010	TR24	CM, SLL, LB, KB	16:52:03	16:56:53	0:28:43:19	0:33:33:53	55.53886	5.093516	27	Lamlash2010_TR24	miniDV	H.264
Tape 13	01/09/2010	TR25	CM, SLL, LB, KB	17:32:02	17:37:20	0:42:03:15	0:47:22:03	55.53711	5.098155	30	Lamlash2010_TR25	miniDV	H.264
Tape 13	01/09/2010	TR26	CM, SLL, LB, KB	17:44:20	17:49:35	0:50:33:09	0:55:48:15	55.53827	5.100275	28	Lamlash2010_TR26	miniDV	H.264
Tape 14	01/09/2010	TR30	CM, SLL, LB, KB	18:33:33		0:01:54:02				27	Lamlash2010_TR30	miniDV	H.264
Tape 14	01/09/2010	TR31	CM, SLL, LB, KB	18:48:30	18:53:41	0:10:35:20	0:15:47:14	55.53089	5.102784	28	Lamlash2010_TR31	miniDV	H.264

APPENDIX 5. SEDIMENT ANALYSIS SUMMARY DATA

Table A5.1 Grab & core sediment analysis summary data

										Method of Moments Arithmetic µm				Method of Moments Geometric µm				Method of Moments logarithmic phi				Method of Folk and Ward µm				Method of Folk and Ward phi			
Field Sample ID	Worksheet	% Gravel (>2mm)	% sand (2mm-63um)	% silt & clay (<63um)	% of silt/clay finer than 4um	% organic carbon in <63um fraction	Sand mode(s) phi	SAMPLE TYPE	TEXTURAL GROUP	SEDIMENT NAME	MEAN	SORTING	SKEWNESS	KURTOSIS	MEAN	SORTING	SKEWNESS	KURTOSIS	MEAN	SORTING	SKEWNESS	KURTOSIS	MEAN	SORTING	SKEWNESS	KURTOSIS	MEAN	SORTING	SKEWNESS	KURTOSIS
D3	A	46.3	53.6	0.1	nd	nd	-0.80	*Unimodal, Well Sorted*	*Sandy Gravel*	*Sandy Very Fine Gravel*	2057	660	0.7	4.3	1912	1.46	-3.119	36.327	-0.94	0.55	3.12	36.33	1950	1.38	0.007	1.044	-0.96	0.47	-0.01	1.04
D4	B	15.1	84.2	0.7	nd	1.30	2.0 -1.0	*Bimodal, Poorly Sorted*	*Gravelly Sand*	*Gravelly Medium Sand*	882	1397	4.29	25.23	472	2.81	0.317	4.417	1.08	1.49	-0.32	4.42	519	2.73	0.393	1.078	0.95	1.45	-0.39	1.08
D6	C	12.3	83.6	4.1	nd	1.40	0.0 -1.0 3.0 4.0	*Polymodal, Poorly Sorted*	*Gravelly Sand*	*Gravelly Very Coarse Sand*	879	815	0.90	2.88	444	4.05	-0.878	3.538	1.17	2.02	0.88	3.54	508	3.47	-0.272	0.691	0.98	1.79	0.27	0.69

Method of Folk and Ward phi	KURTOSIS	1.04	1.12	1.27	2.28
	SKEWNESS	-0.18	-0.09	-0.16	-0.43
	SORTING	0.53	0.54	0.65	1.25
	MEAN	0.81	1.21	1.37	2.03
Method of Folk and Ward µm	KURTOSIS	1.042	1.118	1.271	2.282
	SKEWNESS	0.179	0.092	0.165	0.432
	SORTING	1.45	1.45	1.57	2.37
	MEAN	568	433	386	245
Methods of Moments logarithmic phi	KURTOSIS	12.59	9.25	12.67	9.90
	SKEWNESS	0.24	-0.02	0.51	-2.14
	SORTING	0.59	0.56	0.78	1.76
	MEAN	0.80	1.20	1.37	1.76
Methods of Moments Geometric µm	KUTOSIS	12.592	9.249	12.670	9.902
	SKEWNESS	-0.238	0.022	-0.512	2.144
	SORTING	1.50	1.48	1.72	3.39
	MEAN	573	437	388	294
Method of Moments Arithmetic µm	KURTOSIS	13.92	26.10	18.82	28.64
	SKEWNESS	2.75	3.63	3.59	5.20
	SORTING	309	229	334	6646
	MEAN	634	480	460	1649
	SEDIMENT NAME	*Fine Gravelly Coarse Sand*	*Fine Gravelly Medium Sand*	*Fine Gravelly Medium Sand*	*Gravelly Fine Sand*
	TEXTURAL GROUP	*Slightly Gravelly Sand*	*Slightly Gravelly Sand*	*Slightly Gravelly Sand*	*Gravelly Sand*
	SAMPLE TYPE	*Moderately Well Sorted*	*Moderately Well Sorted*	*Moderately Well Sorted*	*Unimodal, Poorly Sorted*
	Sand mode(s) phi	1.20	1.50	1.8 -1.0	1.5 0.0
% organic carbon in <63um fraction		nd	nd	nd	1.30
% of silt/clay finer than 4um		nd	nd	nd	nd
% silt & clay (<63um)		0.1	0.0	0.3	1.0
% sand (2mm-63um)		98.9	99.5	98.3	91.9
% Gravel (>2mm)		1.0	0.4	1.4	7.1
	Worksheet	D	E	F	G
	Field Sample ID	D7	D9	D11	GM2

Method of Folk and Ward phi	KURTOSIS	1.32	1.45	1.15	0.98	1.18
	SKEWNESS	-0.42	-0.62	-0.07	-0.14	-0.03
	SORTING	1.44	2.31	0.61	0.97	0.61
	MEAN	1.33	0.97	2.74	2.36	2.83
Method of Folk and Ward µm	KURTOSIS	1.319	1.451	1.147	0.984	1.175
	SKEWNESS	0.421	0.625	0.068	0.143	0.031
	SORTING	2.71	4.96	1.53	1.95	1.52
	MEAN	398	512	150	195	140
Methods of Moments logarithmic phi	KURTOSIS	5.19	3.94	15.53	10.27	15.02
	SKEWNESS	-0.78	-1.18	0.43	-0.96	-0.29
	SORTING	1.59	2.41	0.97	1.39	1.15
	MEAN	1.35	0.90	2.76	2.31	2.87
Methods of Moments Geometric µm	KURTOSIS	5.191	3.945	15.528	10.266	15.025
	SKEWNESS	0.782	1.180	-0.434	0.959	0.293
	SORTING	3.01	5.30	1.96	2.63	2.22
	MEAN	393	535	148	202	137
Method of Moments Arithmetic µm	KURTOSIS	43.85	11.73	204.88	62.28	95.90
	SKEWNESS	5.86	3.18	13.44	7.57	9.47
	SORTING	2172	9428	550	1970	972
	MEAN	926	3607	212	514	260
	SEDIMENT NAME	*Gravelly Medium Sand*	*Gravelly Fine Sand*	*Gravelly Fine Sand*	*Gravelly Fine Sand*	*Gravelly Fine Sand*
	TEXTURAL GROUP	*Gravelly Sand*	*Gravelly Sand*	*Slightly Gravelly Sand*	*Slightly Gravelly Sand*	*Gravelly Sand*
	SAMPLE TYPE	*Bimodal, Poorly Sorted*	*Bimodal, Very Poorly Sorted*	*Moderately Well Sorted*	*Moderately Sorted*	*y Well Sorted*
	Sand mode(s) phi	2.3 -0.5	2.5 0.5	3.0 3.5	2.0 3.0	3.0 3.5
% organic carbon in <63um fraction		1.10	1.20	1.00	1.20	0.96
% of silt/clay finer than 4um		nd	nd	nd	nd	nd
% silt & clay (<63um)		0.9	0.9	2.3	2.1	3.4
% sand (2mm-63um)		89.5	80.2	97.0	95.5	95.2
% Gravel (>2mm)		9.6	18.9	0.7	2.4	1.3
	Worksheet	H	I	J	K	L
	Field Sample ID	GM4	GM6	GM8	GM10	GM12

APPENDIX 6 GRAB DESCRIPTIONS

Table A6.1 Grab & core sediment analysis summary descriptions

Method of Folk and Ward Description					
Field sample ID	**MEAN**	**SORTING**	**SKEWNESS**	**KURTOSIS**	**SIMPLE DESCRIPTION OF GRAVEL MATERIAL**
D3	Very Coarse Sand	Well Sorted	Symmetrical	Mesokurtic	Maerl
D4	Coarse Sand	Poorly Sorted	Very Coarse Skewed	Mesokurtic	Maerl shell and stone
D6	Coarse Sand	Poorly Sorted	Fine Skewed	Platykurtic	0.00
D7	Coarse Sand	Moderately Well Sorted	Coarse Skewed	Mesokurtic	stone and shell
D9	Medium Sand	Moderately Well Sorted	Symmetrical	Leptokurtic	Shell, stone, maerl
D11	Medium Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic	maerl and shell
GM2	Fine Sand	Poorly Sorted	Very Coarse Skewed	Very Leptokurtic	Whole and broken shell
GM4	Medium Sand	Poorly Sorted	Very Coarse Skewed	Leptokurtic	Barnacle encrusted stone, broken hell, maerl and Turritella
GM6	Coarse Sand	Very Poorly Sorted	Very Coarse Skewed	Leptokurtic	Whole and broken shell, stone
GM8	Fine Sand	Moderately Well Sorted	Symmetrical	Leptokurtic	shell
GM10	Fine Sand	Moderately Sorted	Coarse Skewed	Mesokurtic	shell and stone
GM12	Fine Sand	Moderately Well Sorted	Symmetrical	Leptokurtic	Turritella, broken shell, black stones

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